Chapter 1
Purpose and Need

1.1 Introduction

This chapter describes the actions requiring preparation of this *Draft Supplemental Environmental Impact Statement for the International Boundary and Water Commission South Bay International Wastewater Treatment Plant Long-Term Treatment Options* (Draft SEIS) and the alternatives considered in the Draft SEIS. The lead agencies preparing this Draft SEIS in accordance with the National Environmental Policy Act (NEPA) are the International Boundary and Water Commission, U.S. Section (USIBWC), and the U.S. Environmental Protection Agency (EPA).

This chapter presents the purpose and need for the South Bay International Wastewater Treatment Plant (SBIWTP), including alternatives to activated sludge treatment for wastewater from Tijuana, Mexico. The purpose and need, as presented below in Section 1.4, are described in accordance with NEPA. Under NEPA, an EIS must specify "the underlying purpose and need to which the agency is responding" (40 CFR § 1502.13). Together, the purpose and need establish the basic parameters for identifying the range of alternatives to be considered under NEPA.

This Draft SEIS addresses long-term alternatives for wastewater treatment at the SBIWTP. The alternatives, which are discussed in detail in Section 1.5, are:

- Activated Sludge / No Action (No Action)
- SBIWTP with Activated Sludge Secondary Treatment
  - Activated Sludge with Flow Equalization Basin (Activated Sludge with FEB)
  - Activated Sludge with Expanded Capacity
- SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment
  - Completely Mixed Aerated System at Hofer Site (CMA at Hofer)
  - Advanced Integrated Pond System at Spooner's Mesa Site (AIPS at Spooner's Mesa)
- SBIWTP with Less than Full Secondary Effluent
  - Advanced Primary Only
  - Partial Secondary Treatment

The alternatives considered but eliminated from further consideration are: (1) Water Reclamation, (2) Tertiary Treatment, and (3) Long-term Use of the Parallel Conveyance and Pump Station. These alternatives are discussed in Section 1.6. These alternatives were rejected because they do not meet the objectives of providing alternatives to activated sludge secondary treatment or because they are not technologically feasible for the site conditions at the SBIWTP. The Preferred Alternative will be identified in the Final SEIS.

To provide context for the reader, this Draft SEIS provides summary information on the background of the project and the existing conditions in the vicinity of the SBIWTP. Much of this information is found in greater detail in several recent environmental documents prepared for the SBIWTP. Specifically, the *Draft and Final Environmental Impact Statements for the International Boundary and Water Commission International Wastewater Treatment Plant and Outfall Facilities* (RECON, 1991 and 1994) and the *Draft and Final Supplemental Environmental Impact Statements for the International Boundary and Water Commission International Wastewater Treatment Plant Interim Operation* (Interim Operation SEIS) (RECON, September 1996 and November 1996) contain extensive descriptions of existing conditions in the vicinity of the SBIWTP. These data are summarized in this Draft SEIS, where applicable. In instances where new information has become available in the interim since these two documents were prepared, the additional information is described in Chapter 2, Affected Environment, and is used to analyze impacts in Chapter 3, Environmental Consequences. Chapter 4 evaluates the cumulative impacts associated with the alternatives and Chapter 5 is a summary of applicable regulations for the United States and Mexico. Chapter 6 discusses long-term productivity. Chapters 7, 8, and 9 present the document preparers, references, and acronyms.

1.2 Historical Setting

1.2.1 History of Contamination

Tijuana, Mexico, is located immediately south of San Diego, California, United States. As a result of Tijuana’s rapid and continuous population growth and corresponding limitations of local wastewater conveyance and treatment services in Mexico, the Tijuana River valley and near-shore coastal waters of the United States have been contaminated with raw wastewater since the 1930s. About two-thirds of Tijuana’s current population of approximately 1 million is connected to a sewer system. The Tijuana River basin, in which a significant portion of the Tijuana Municipality is located, drains to the northwest, and any release of unsewered wastewater follows this natural drainage. Wastewater from Tijuana, Mexico has historically flowed into the United States via the Tijuana River or through north-draining canyons and gullies. Untreated wastewater is also discharged to near-shore ocean waters in Mexico, 5.6 miles (9 km) south of the international border. In 1997, the monthly average flow of collected wastewater from central and western Tijuana was about 34 million gallons per day (mgd).

Wastewater contamination associated with these flow patterns is recognized by numerous emergency declarations by local, state, and federal legislative bodies and commissions, and has been the subject of international agreements between the United States and Mexico. To address this international problem, the United States and Mexico entered into binational agreements (referred to as Minutes) to construct and operate new facilities in both countries to collect, treat, and dispose of wastewater. These Minutes are included in their entirety in Appendix A1. Over the past five decades, local agencies and governments in Mexico and the United States have undertaken various improvements to alleviate wastewater flow coming into the United States.

1.2.2 South Bay International Wastewater Treatment Plant Environmental Review

In addition to the historical improvements in infrastructure for treating wastewater, the SBIWTP has been the subject of extensive environmental review. In 1990, a Draft EIS was prepared for the construction of a secondary wastewater treatment plant at the Dairy Mart Road site with discharge to the ocean through the South Bay Land Outfall (SBLO) and South Bay Ocean Outfall (SBOO). The Draft EIS (RECON, 1991) was released in May 1991 and, after subsequent review, the Final EIS (1994 Final EIS) (RECON, 1994) was released in February 1994. The EIS addressed the environmental impacts of the SBIWTP, the SBOO, and collection and pumping facilities for capturing renegade flows from canyons and the Tijuana River. As evaluated in the 1994 Final EIS, the SBIWTP comprised advanced primary treatment, activated sludge secondary treatment, disinfection, and discharge to the ocean. In the 1994 Final EIS, the ocean modeling and impacts in the ocean were based on a 25-mgd (1,095 L/s) average flow from SBIWTP without consideration of peak flows. See the design hydrograph shown in Figure 2 in Appendix B1 for average and peak would be treated by lime stabilization and hauled to Mexico. Ten alternative sites were reviewed, two of which were evaluated in the Draft and Final EIS documents. Four project alternatives were considered in that EIS:

- Alternative 1: No project (continued flows to the Tijuana River with impacts to water quality)
- Alternative 2: 25-mgd (1,095 L/s) treatment plant on the Dairy Mart Road site
- Alternative 3: 25-mgd (1,095 L/s) treatment plant on the Tijuana Street site
- Alternative 4: Standby interceptor in the Tijuana River valley

The 1994 Final EIS identified Alternative 2, the SBIWTP at the Dairy Mart Road site, as the Preferred Alternative. The engineering design was prepared for advanced primary facilities and activated sludge secondary facilities. The design allowed for sequential construction to provide advanced primary treatment as soon as possible. The design initially included anaerobic digestion of sludge, but this was replaced by lime stabilization.

The Record of Decision (ROD) for the 1994 Final EIS was approved in May 1994 by the USIBWC, EPA, and the U.S. Army Corps of Engineers (1994). The ROD identified Alternative 2 of the 1994 Final EIS as the selected alternative (i.e., a 25-mgd [1,095 L/s] secondary treatment plant on the Dairy Mart Road site). Significant impacts were discussed with mitigation measures to reduce the impacts. The most significant impact avoidance measure was the proposed use of tunneling to construct the ocean outfall, thereby avoiding impacts to the Tijuana River and a number of federally listed endangered species. The ROD documented the major issues raised in the 1994 Final EIS, including water reclamation, ocean water quality impacts, toxics in the effluent, impacts to sports fishing, and discharge into the recurring eddy system of the South Bay. Other issues involved the use of a pond system for secondary treatment and the seismic reliability of the SBLO. The lead agencies' (USIBWC and EPA) decision was based on the technical reports prepared in support of the 1994 Final EIS and included in the Draft and Final EIS documents.

An Interim Operation SEIS (1996) was prepared by RECON for USIBWC and EPA to evaluate proposed project changes to operate the SBIWTP as an advanced primary treatment facility on an interim basis (i.e., between completion of the advanced primary facilities and any subsequent secondary facilities). It also evaluated the effects of discharge of advanced primary effluent through the SBOO until alternatives to secondary treatment could be evaluated. Six alternatives were evaluated:

- Alternative 1: No Action, no operation until secondary treatment is completed.
- Alternative 2: Operate the SBIWTP advanced primary treatment and discharge through the emergency connection with excess peak flows being discharged to the Tijuana River in the United States.
- Alternative 3: Operate the SBIWTP advanced primary treatment with a flow equalization basin to hold treated peak flows for discharge to the emergency connection during off-peak hours (with excess peak flows being discharged to the Tijuana River in the United States).
- Alternative 4: Operate the SBIWTP advanced primary treatment with new conveyance to Mexico for discharge near San Antonio de los Buenos.
- Alternative 5: Operate the SBIWTP advanced primary treatment with discharge to the SBOO.
- Alternative 6: Operate the SBIWTP advanced primary treatment with phased discharge. Initial discharge would be through the emergency connection. Subsequent discharge would be through the SBOO after construction is completed.

The Preferred Alternative was Alternative 6 because it was found to have the maximum level of treatment for the greatest volume of wastewater. The preferred approach in the Interim Operation SEIS was to operate the SBIWTP as an advanced primary facility and discharge to the emergency connection until the SBOO was completed in 1998. Thereafter, the advanced primary effluent would discharge through the SBOO until any secondary treatment facilities were constructed. If selected, secondary effluent would discharge through the SBOO.

An NPDES discharge permit was issued by the California Regional Water Quality Control Board (CRWQCB) in November 1996, for operation of the full secondary SBIWTP. A Cease and Desist Order was issued simultaneously with the NPDES permit because discharges of advanced primary effluent would not meet the discharge limits stated in the NPDES permit. This Cease and Desist Order includes a compliance schedule to reach secondary treatment by December 31, 2000. The Cease and Desist Order allows for interim operation and discharge of advanced primary effluent until the USIBWC can complete construction of the secondary facilities or until the end of 2000. If secondary facilities are not complete at the end of 2000, the USIBWC must seek an extension of the Cease and Desist Order from the CRWQCB. As part of the order, the CRWQCB requires the USIBWC to prepare a headworks analysis and perform monitoring of the ocean, sludge, and the river (if a discharge to the river occurs).

1.2.3 International Agreements

USIBWC Minutes 270 (April 30, 1985), 283 (July 2, 1990), and 296 (April 16, 1997) are international agreements that document the decisions made by the United States and Mexico for collecting, treating, and disposing of wastewater from Tijuana that has historically entered the Tijuana River valley in the United States. The Minutes provide the basis for a cooperative approach for the United States and Mexico to manage wastewater in the Tijuana-San Diego border region. See Appendix A1 for the full text of Minutes 270, 283, and 296.

1.2.3.1 Minute 270

Minute 270 recommended the first stage of treatment and disposal facilities for Tijuana wastewater. The minute contained the following elements:

- Conveyance of wastewater in the Tijuana River basin to Pump Station One; improved capacity to 34-mgd (1,489 L/s) average capacity and 62-mgd (2,716 L/s) peak capacity
- Conveyance of wastewater via a 42-inch (107-cm) force main with a peak capacity of 62 mgd (2,716 L/s) for discharge to the existing conveyance canal
- Collection, pumping, and conveyance from canyon areas for discharge through conveyance canal
- Pumping and conveyance from the Playas de Tijuana area to the conveyance canal
- Conveyance via a covered and open canal for ocean (surf) disposal of wastewater 5.6 miles (9 km) south of the international boundary
- Construction of two secondary treatment facilities (Modules 1 and 2), each with an average capacity of between 17 mgd (743 L/s) and 25 mgd (1,095 L/s) and aerated facultative lagoons at a location 4 miles (6.4 km) south of the international boundary.

In keeping with Minute 270, Mexico constructed Module 1 at San Antonio de los Buenos in 1987 to serve the Tijuana Municipality.

1.2.3.2 Minute 283

Minute 283 provided the conceptual plan for an international solution to collection, treatment, and disposal of wastewater from Tijuana in excess of existing capacity in Tijuana. The IBWC adopted the following facility and program elements:

- Construction of an international treatment plant in the United States to replace the second module of the first stage of wastewater treatment facilities planned in Minute 270
- Completion by Mexico of a wastewater collection system for the Tijuana Municipality
- Construction of a conveyance system to deliver wastewater to the international treatment plant
- Design and construction of a secondary treatment plant with disinfection facilities and sludge digesters, with a capacity of 25 mgd (1,095 L/s)
- Construction of a pipeline system and an ocean outfall to convey and dispose of treated wastewater to the ocean from the international plant
- Conveyance of sludge generated in the SBIWTP to Mexico for disposal

- The right of Mexico to reuse the treated effluent from wastewater generated by Mexico
- A requirement for a pretreatment program in Tijuana for industries discharging to the international treatment plant (see Section 1.2.4 and Appendix A2)

1.2.3.3 Minute 296

In accordance with Minute 296, the United States and Mexico agreed to procedures for operating and sharing cost for the SBIWTP. In addition, the IBWC has coordinated with the responsible authorities in both Mexico and the United States to conduct the necessary actions for operating the treatment plant and disposing of sludge in Mexico. Minute 296 specifies the distribution of costs for construction, operation, and maintenance of the SBIWTP, as follows:

- Mexico will pay $1.68 million per year for 10 years to cover its share of the costs for construction of the SBIWTP. The operation and maintenance (O&M) costs of the SBIWTP chargeable to Mexico for up to 25 mgd (1,095 L/s) will be $0.034 per cubic meter ($m^3$) beginning with operations startup.
- If wastewater from canyons and other collectors is conveyed to and treated at the SBIWTP, Mexico will report the discharge events and volumes and pay $0.034/$m^3$ for these volumes.
- Hydraulic and influent water quality monitoring will be performed by the United States. The data will be shared with Mexico for Mexico's implementation of its industrial wastewater pretreatment program that will be based on Mexican standards (see Section 1.2.4 and Appendix A2).
- The IBWC will review alternatives for future treatment of Tijuana wastewater in excess of 25 mgd (l,095 L/s), make recommendations regarding the practicality of handling flows in excess of 25 mgd (1,095 L/s) at the SBIWTP, and recommend the terms for Mexico's financial participation associated with those recommendations.
- In case of an interim discharge of advanced primary treated effluent to Mexico, the IBWC will make the necessary arrangements for an appropriate conveyance and disposal infrastructure system in Mexico. In the case of an interim discharge of advanced primary treated effluent using the emergency connection to the City of San Diego, the cooperation of Mexico would be necessary to handle, to the extent possible, the flows in excess of the emergency connection capacity as may be generated.
- The IBWC will prepare recommendations for additional infrastructure to collect the remaining wastewater, stormwater, and other drainages that discharge to the Tijuana River without treatment.

1.2.4 Status of Mexico's Pretreatment Program

In accordance with Mexican state and federal laws and Minute 283, Mexico has initiated an industrial pretreatment program in Tijuana, which includes registration of dischargers and spot checking of facilities. Mexico is supported by California state agencies (the CRWQCB and the State Water Resource Control Board [SWRCB]) and by the City of San Diego in development of the program. The IBWC has monitored and will continue to monitor raw wastewater from Tijuana. The monitoring results will be provided to the appropriate Mexican agencies for their use in developing the pretreatment program. These data will be considered by Mexico when applying Mexican federal, state, and local laws for industrial pretreatment and Mexican standards for ocean discharge.

The Cease and Desist Order and Permit required USIBWC to conduct a headworks analysis for both the advanced primary treatment and for secondary treatment, if selected. Both U.S. and Mexican effluent and sludge standards are applied in the headworks analyses.

The headworks analysis for the advanced primary treatment was completed in 1997. Ongoing monitoring for raw and treated wastewater will be used to update the existing headworks analysis and to develop any future headworks analysis. Future headworks analysis is pending the selection of the Preferred Alternative in the Final SEIS.

The IBWC is assisting appropriate Mexican agencies with a wastewater characterization effort to identify those constituents in the raw wastewater that could cause the SBIWTP to exceed the allowable discharge limits for either advanced primary or secondary effluent or exceed United States and Mexican sludge standards. In addition, the City of San Diego, the CRWQCB, and SWRCB are working with Mexico's Department of Ecology to develop the institutional capacity for implementing Tijuana's pretreatment program. The City of San Diego is providing inspector and laboratory training to Department of Ecology personnel to enhance their expertise. Additional information on Mexico's pretreatment and pollution prevention program is provided in Appendix A2.

1.3 Project Setting and Facilities Description

This section provides a brief overview of the physical setting of the project and the existing wastewater infrastructure.

1.3.1 Physical Setting of Project

The SBIWTP occupies approximately 75 acres (30.4 ha) of land in the United States (San Diego County) on the border of the United States and Mexico. The regional location of the SBIWTP is shown in Figure 1.3-1. The facility is directly north of Tijuana, Mexico, with an intervening 300-foot buffer of land between the United States-Mexico boundary and the SBIWTP in the United States. The plant is located in the Tijuana River valley in the Tijuana River watershed. Both the Tijuana River estuary and the Pacific Ocean lie west about 3.75 miles (5.63 km) and downstream of the project site. The closest major U.S. roadway is Interstate 5 (I-5), which is approximately 1.5 miles (2.4 km) from the SBIWTP off Dairy Mart Road and Monument Road in San Diego.

1.3.1.1 Project Vicinity—United States

On the United States side of the border, the area is sparsely populated. Most of the major development is north of I-5 in the community of San Ysidro and west of I-5 in Imperial Beach. The areas south and southwest of I-5, where the SBIWTP and the alternatives analyzed in this SEIS are located, are largely undeveloped. A large portion of the surrounding land is publicly owned. The main feature of this area, other than the SBIWTP

Figure

1.3-1 Regional Location Map

(8 ½ x 11)

facilities, is natural open space including the Tijuana River Valley Regional Open Space Park. Agriculture, ranches, and quarries occupy private lands. To the immediate west of the SBIWTP are lands owned by the City of San Diego. To the far west is a public coastal recreation area, the Border Field State Park. The Imperial Beach Naval Air Station and the City of Imperial Beach are north of the SBIWTP. The western Tijuana River valley is federally designated as the Tijuana River National Estuarine Research Reserve (TRNERR), which was established by the National Oceanic and Atmospheric Administration (NOAA) to protect one of the few remaining large areas of coastal wetland in southern California. Since 1982, the County of San Diego Parks and Recreation Department and the California Coastal Conservancy, have been acquiring land in the estuary. Additional information on the U.S. project vicinity is provided in Chapter 2.

1.3.1.2 Project Vicinity—Mexico

In contrast to the setting of the SBIWTP in the United States, Tijuana, Mexico, is a major urban area. The 1996 population was estimated at about 1.1 million. Much of the sewage generated by this urban area drains to the site. In 1990, 65 percent of the occupied housing units had sewer connections. Tijuana has approximately 2,500 industrial plants, including manufacturing; chemical substances and petroleum; minerals, paper, and printing; wood and wood products; textiles, clothing, and leather; and food and beverage products.

The municipality of Tecate is about 30 miles (48 km) east of Tijuana and had a population of about 52,000 in 1990. Tecate has approximately 120 industrial plants, and manufacturing is the principal sector of the local economy. Tecate and the Tecate brewery have wastewater treatment plants that discharge to the watershed (RECON, 1994). Additional information on the Mexican project vicinity is provided in Chapter 2.

1.3.2 United States and Mexican Facilities

This section presents an overview of the existing wastewater conveyance, treatment, and disposal system at the SBIWTP facility in the United States and the facilities in Mexico. This system spans both countries, with the majority of the facilities located in Mexico.

Since the publication of the 1994 Final EIS, modifications to the construction schedule for the SBIWTP have occurred. These changes include the decision to phase construction of the SBIWTP to expedite construction of the advanced primary facility to provide treatment of flows from Tijuana as quickly as possible. The decision was also made to operate the SBIWTP as an advanced primary treatment plant on an interim basis until the SEIS is complete and a decision is made regarding secondary treatment. The decision also was made to postpone construction of the dechlorination facility at Goat Canyon.

1.3.2.1 SBIWTP and Related Facilities

The SBIWTP facilities are designed to treat an average of 25 mgd (1,095 L/s) of wastewater from Tijuana with disposal to the ocean via the SBOO. The SBIWTP site location and U.S. facilities are shown in Figure 1.3-2. As initially planned, the facilities would include the following:

- Advanced primary treatment at the SBIWTP (construction completed in 1997)

Figure

1.3-2 Site Location Map

(8-1/2x11)

- Activated sludge secondary treatment at the SBIWTP (designed, but alternatives to activated sludge are being considered in this SEIS)
- Facilities for capturing and pumping wastewater flows from Stewart's Drain, Silva Drain, and Canyon del Sol, which were completed in 1997; and from Smuggler Gulch and Goat Canyon, which are under construction and scheduled for completion in early 1998
- The SBLO (completed in 1993) and SBOO (under construction and scheduled for completion in 1998)

The SBIWTP site, which encompasses approximately 75 acres (30.4 ha) located off Dairy Mart Road in the Tijuana River valley in the United States, is about 300 feet (91 m) north of the border across from Pump Station One in Tijuana. The facility has been constructed and is currently available for operation as an advanced primary treatment plant only. The headworks at the SBIWTP is able to screen and degrit up to 100 mgd (4,380 L/s). The primary sedimentation basins can treat peak flows up to 75 mgd (3,285 L/s). As designed, the unconstructed activated sludge facilities could treat a constant flow of 25 mgd (1,095 L/s).

City of Tijuana wastewater is currently conveyed to the lift station at the San Antonio de los Buenos in Mexico treatment plant (see Figure 1.3-3). Until the SBOO is in operation, excess flows up to 13 mgd (569 L/s) will be treated at Point Loma on an interim basis. In 1997, average monthly flow was about 10 mgd through the Emergency Connection for treatment at Point Loma. Flows that exceed the capacity at these two locales will be treated at the SBIWTP to the advanced primary treatment level for discharge to the Tijuana River. Wastewater flows from Playas de Tijuana, Matadero (Smuggler Gulch), and Los Laureles (Goat Canyon) pump stations in Mexico will continue to be conveyed to the San Antonio de los Buenos lift station. If any wastewater-contaminated, dry-weather flows from Mexico enter the United States through Goat Canyon, Smuggler Gulch, Silva Drain, Stewart's Drain, or Canyon del Sol, these flows will be captured by the new USIBWC facilities currently under construction and routed to the SBIWTP.

The new Smuggler Gulch and Goat Canyon facilities include pump stations that will pump the wastewater through buried pipelines within the SBLO alignment. The new collection and conveyance facilities in Goat Canyon and Smuggler Gulch are intended to be backup facilities only for those facilities located in and operated by Mexico.

Discharge of treated effluent to the ocean will be through the SBLO and the SBOO. The SBLO is a 12,300-foot (3,444-m) buried pipeline extending from Dairy Mart Road to the mouth of Goat Canyon where it connects to the SBOO. It is intended that the SBLO will convey wastewater to the SBOO from the SBIWTP and from the City of San Diego's proposed Otay and South Bay treatment plants.

The SBOO consists of a drop shaft, tunnel, vertical riser, sea floor pipeline, and a wye-shaped diffuser that transport the effluent from the SBLO to the ocean discharge point 18,700 feet (5.7 km) offshore at a depth of 93 ft (28 m). The wye is approximately 3 nautical miles out to sea as measured from mean lower low water (MLLW) level. The average flow capacity of the outfall is 174 mgd (7,621 L/s), and the peak daily flow capacity is 333 mgd (14,585 L/s), which provides capacity for future Mexico and U.S. flows.

Figure

1.3-3 Existing Mexican Pumping and Conveyance Facilities

(8-1/2x11)

1.3.2.2 Mexico's Facilities

The following is a description of the wastewater facilities in Mexico, and is provided as context for the SBIWTP infrastructure in the United States. These features are shown in Figure 1.3-3. Most of the wastewater generated in eastern and central Tijuana is collected at Pump Station One. Other wastewater from central and western Tijuana is collected at other pump stations at Los Laureles, Mataderos, and Playas de Tijuana. Wastewater is pumped via force mains to an open canal that travels south to the San Antonio de los Buenos Wastewater Treatment Plant for treatment or it bypasses the plant and is discharged directly at the shoreline 5.6 miles (9 km) south of the international border. In 1997, average monthly flow through the conveyance canal was about 32 mgd (1,402 L/s).

Improvements to Mexico's wastewater collection system include:

- Construction of a diversion structure in the Tijuana River in Mexico near the international border (the river collector) in October 1991. Up to 13 mgd (569 L/s) of river flows and wastewater can be captured by this structure and diverted to the Tijuana collection system during dry weather.
- New facilities in canyon areas that have reduced wastewater flows into the Tijuana River
- Extension of 72-inch (1.8-m) interceptor line (see 1994 Final EIS and Minute 283 in Appendix A1)
- Upgrades to Pump Station One in 1995
- Increased sewering in residential areas

The San Antonio de los Buenos treatment facility (see Figure 1.3-3) was designed with 2 modules to treat up to an average of 17 mgd (745 L/s) each. It is located 4.2 miles (6.8 km) south of the international boundary. Wastewater is pumped to aerated facultative lagoons followed by a nonaerated polishing lagoon. The treated effluent is disinfected with chlorine. Effluent from the treatment plant and wastewater that exceeds the capacity of the San Antonio de los Buenos plant is conveyed in a canal to a canyon located in the Punta Bandera area and then discharged to the surf.

In addition to the recent improvements in Mexico's wastewater treatment facilities, Mexico is developing two new projects to manage, treat, and discharge to the ocean the balance of wastewater generated within Tijuana that will not be routed to the SBIWTP. These two projects, which are sponsored through the State Public Services Commission of Tijuana (Comision Estatal de Servicios Públicos de Tijuana [CESPT]), include:

- The construction of a new parallel pump station and conveyance system to transport wastewater to the San Antonio de los Buenos Wastewater Treatment Plant
- The expansion and rehabilitation of the San Antonio de los Buenos Wastewater Treatment Plant

The new parallel conveyance system, which provides redundancy, will include a new lift station with the capacity to pump an average flow of 25 mgd (1,095 L/s) and a peak of 50 mgd (2,190 L/s). The 16-km conveyance system, which will run parallel to the existing channel, comprises a 48-inch (122-cm) pressure pipe followed by a 54-inch (137-cm) gravity pipe to the San Antonio de los Buenos treatment plant. The conveyance project will allow for needed repairs to Tijuana's existing conveyance system and will help prevent sewage spills into the Tijuana River in dry weather.

The San Antonio de los Buenos treatment plant upgrades are designed to increase treatment capacity within the existing treatment facilities and to improve sludge handling. The improvements are projected to increase the treatment capacity from 17 mgd (743 L/s) to 25 mgd (1,095 L/s). When combined with SBIWTP treatment capacity, this would meet the current treatment demand of 42.8 mgd (1,875 L/s) projected for 1997 (RECON, 1996a, b).

These projects were certified by the Border Environment Cooperation Commission (BECC) on June 18, 1997. This certification allows CESPT to apply for a $16 million grant and a $2 million loan from the North American Development Bank (NADBank) for construction of the facilities.

1.4 Purpose and Need for Action

NEPA (40 CFR Section 1502.13) requires a brief statement of the underlying purpose and need to which the lead agencies are responding. The purpose of the SBIWTP project is to provide new wastewater management facilities to safeguard the public health, environment, public beaches, water quality, and economy of San Diego, California and Tijuana, Baja California. In conjunction with actions taken by Mexico, this project would minimize dry-weather flow of untreated sewage from the municipality of Tijuana, Baja California, Mexico into the United States. Such flows have caused chronic and substantial pollution in the Tijuana River valley and the Tijuana River Valley National Estuarine Research Reserve, in coastal areas used for agriculture and public recreation, and in areas designated as critical habitat for federal- and state-listed endangered species.

This original need, which was identified in the 1994 Final EIS and ROD, remains valid for this Draft SEIS. Since the 1994 Final EIS and ROD were completed, additional information has become available and new circumstances have arisen that require additional consideration of long-term treatment options for the SBIWTP. The purposes of the proposed action are to:

- Consider the environmental impacts of peak sewage flows that would not receive secondary treatment at the SBIWTP as designed and described in the 1994 Final EIS. The 1994 EIS does not address treatment of peak flows above 25 mgd (1,095 L/s).
- Evaluate additional technical information on the feasibility of alternative methods of achieving secondary treatment, including pond systems, that has become available since the 1994 Final EIS and ROD.
- Incorporate new technical information on the constituents in and chemical makeup of Mexican wastewater.
- Collect and analyze new baseline sampling data on marine water quality.
- Consider increasing budgetary constraints that necessitate a closer review of all major program expenditures.

1.5 Alternatives Considered in Detail

The alternatives for this Draft SEIS were developed in accordance with NEPA requirements for analysis of a reasonable range of project alternatives.

NEPA requirements for alternatives analysis (40 CFR 1502.14) direct federal agencies to:

- Consider a range of alternatives that could accomplish the lead agency's objectives (i.e., purpose and need) and present the alternatives in comparative form to define the issues and provide a clear basis for decision makers and the public to choose among options.
- Explore rigorously and evaluate objectively a reasonable range of alternatives. If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons they were eliminated. The range of alternatives is project specific, depending on the nature of the proposal and the facts and circumstances of the project.
- Analyze each alternative to a degree that is substantially similar to the analysis afforded the Proposed Action.
- Identify in the ROD the "Environmentally Preferable" alternative from the range of alternatives considered. This alternative is considered to be the one that best promotes the environmental policy expressed in NEPA.
- Include a "No Action" alternative.

All the alternatives considered in this SEIS, including the No Action alternative, incorporate some form of primary treatment of wastewater from Tijuana. In addition, for all alternatives, flows of treated effluent from the SBIWTP would not be discharged to the Tijuana River because the SBOO will have adequate capacity to accept the flows. The alternatives are discussed in detail in Sections 1.5.1 through 1.5.4 (see Figure 1.5-1 for locations of the alternatives). One fundamental assumption made for all of the alternatives is that Mexican conveyance facilities are sized to handle average flows of 50 mgd (2,190 L/s). Of this 50 mgd, 25 mgd (1,095 L/s) can be conveyed to the SBIWTP and 25 mgd (1,095 L/s) to San Antonio de los Buenos. A peak flow of up to 100 mgd (4,380 L/s) can be conveyed: 50 mgd (2,190 L/s) to SBIWTP and 50 mgd (2,190 L/s) to San Antonio de los Buenos). Technical reports prepared in support of these alternatives are in Appendix B.

1.5.1 Activated Sludge/No Action Alternative

For the Activated Sludge/No Action alternative (No Action alternative), the SBIWTP would have the same activated sludge secondary treatment as described in the 1994 Final EIS. The basis for this alternative is that sewage flow to the SBIWTP would be at a constant flow rate of 25 mgd (1,095 L/s) although wastewater flows are currently not constant and are less than 25 mgd (1,095 L/s). Pump Station One in Tijuana would be operated to direct all fluctuations in daily sewage flow to treatment elsewhere in Mexico while a constant wastewater flow of 25 mgd (1,095 L/s) would be directed to the SBIWTP. The average and peak flows through both primary and secondary treatment would be 25 mgd (1,095 L/s).

The physical layout of the SBIWTP facility features for the No Action alternative is shown in Figure 1.5-2. An operational schematic of the facilities required for the No Action alternative is shown as Figure 1.5-3.

Figure

1.5-1 Location Map of Facilities

(8 ½ x 11)

Figure

1.5-2 Physical Features for No Action and Activated Sludge Alternatives

(11x17)

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Figure

1.5-3 No Action Alternative: System Operations

(8-1/2x11)

The proposed new facilities would include the following major elements:

- Six single-pass conventional activated sludge tanks with fine bubble diffusers and anoxic zone “selectors,” including one aeration blower structure with three blowers
- Eight secondary sedimentation tanks with return-activated sludge pump facilities, secondary skimming pump station, and electrical local control center
- Two 27-foot-diameter dissolved air flotation thickeners with chemical addition facilities
- One 34-foot-diameter sludge storage tank

Extension of the support facilities, such as yard piping to accommodate the expanded site and facilities associated with the secondary treatment facilities

For a full description of the facilities associated with the No Action alternative, see the 1994 Final EIS.

These proposed new activated sludge and related facilities are sized to treat an average monthly organic loading of 370 milligrams per liter (mg/L) 5-day biochemical oxygen demand (BOD_5), 350 mg/L total suspended solids (TSS), and an average flow of 25 mgd (1,095 L/s) plus in-plant recycle flows. The facilities are not designed to treat peak flows above 25 mgd (1,095 L/s). The activated sludge facilities are designed to provide an effluent quality of 19 mg/L of BOD_5 and 19 mg/L of TSS.

1.5.2 SBIWTP with Activated Sludge Secondary Treatment

This alternative comprises activated sludge secondary treatment at the SBIWTP to accommodate an average flow of 25 mgd (1,095 L/s) with options for varying peaking factors. The first option (see Section 1.5.2.1) involves the construction of a flow equalization basin to accommodate a peak flow of up to 50 mgd (2,190 L/s). The second option under this alternative (see Section 1.5.2.2) involves an increase in the capacity of the secondary facility at the SBIWTP to treat peak flows up to 50 mgd (2,190 L/s). To accomplish this, the number of secondary clarifiers will be doubled from 8 to 16.

1.5.2.1 Activated Sludge with Flow Equalization Basin

This alternative would result in an average flow of 25 mgd (1,095 L/s) into the SBIWTP with flow equalization basins to accommodate peak flow storage and subsequent off-peak discharge to the secondary activated sludge facility. Flow equalization basins capable of storing peak flows greater than 25 mgd (1,095 L/s) would be constructed for this alternative. A storage volume of 7 million gallons (MG) would be required (see Appendix B1, Conceptual Design of Flow Equalization Facility). Accordingly, the average flow through both the advanced primary and secondary portion of the plant is 25 mgd (1,095 L/s). Flow through the primary portion of the plant would follow the daily flow variations with a low flow of about 3.5 mgd (153 L/s) and a peak flow of up to 50 mgd (2,190 L/s). Before this variable flow enters the secondary portion, it is equalized by the basins to a steady rate of 25 mgd (1,095 L/s).

The flow equalization basins would be located within the existing footprint of the SBIWTP (see Figure 1.5-4). An operational schematic of the facilities required for this alternative is shown in Figure 1.5-5. The proposed new facilities would include the following major elements:

- One 7.0-MG equalization basin, along with a pump station capable of pumping up to 21.5 mgd (942 L/s) to the activated sludge process (As originally envisioned, two flow equalization basins would be constructed: an initial 5.5-MG basin followed by a 1.5-MG basin. See Appendix B1 for the engineering analysis using this approach. Contractual delays in construction of the 5.5-MG basin, coupled with reevaluation of the flow capacities through the emergency connection, has resulted in a decision to construct a single 7.0-MG basin. This single basin approach has been taken into consideration for the present value cost estimates presented in Appendix B2.)
- Six single-pass conventional activated sludge tanks with fine bubble diffusers and anoxic zone “selectors” including one aeration blower structure with three blowers
- Eight secondary sedimentation tanks with return-activated sludge pump facilities, secondary skimming pump station, and electrical local control center
- Two 27-foot-diameter (823-cm) dissolved air flotation thickeners with chemical addition facilities
- One 34-foot-diameter (1,036-cm) sludge storage tank
- Extension of the support facilities such as yard piping to accommodate the expanded site and facilities associated with the secondary treatment facilities

These proposed new activated sludge and related facilities are sized to treat a monthly average organic loading of 370 mg/L BOD_5, and 350 mg/L TSS, and an average flow of 25 mgd (1,095 L/s) plus in-plant recycle flows. The equalization basin facility is designed to equalize peak flows of up to 50 mgd (2,690 L/s). The flows to the activated sludge facility would be equalized to a 25-mgd (1,095 L/s) constant flow. The activated sludge facility is designed to provide an effluent quality of 19 mg/L BOD_5 and 19 mg/L TSS.

1.5.2.2 Activated Sludge with Expanded Capacity

For this alternative, the secondary facility would be sized to treat peak flows up to 50 mgd (2,190 L/s). To do so, the number of secondary clarifiers would be doubled from 8 to 16 to accommodate the peaks. Thus, an average flow of 25 mgd (1,095 L/s) with peak flows up to 50 mgd (2,190 L/s) would be treated by both the advanced primary and the secondary facilities.

The proposed new facilities, which would be located on current SBIWTP and Hofer sites (see Figure 1.5-6), would include the following major elements:

- Six single-pass conventional activated sludge tanks with fine bubble diffusers and anoxic zone “selectors” including one aeration blower structure with four blowers
- Sixteen secondary sedimentation tanks with return-activated sludge pump facilities, secondary skimming pump station, and electrical local control center

- Two 27-foot-diameter (823-cm) dissolved air flotation thickeners with chemical addition facilities
- One 34-foot-diameter (1,036-cm) sludge storage tank

Extension of the support facilities such as yard piping to accommodate the expanded site and facilities associated with the secondary treatment facilities

An operational schematic of the facilities required for the SBIWTP with Activated Sludge with Expanded Capacity is shown in Figure 1.5-7. These proposed new activated sludge and related facilities are sized to treat an average monthly organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd (1,095 L/s) plus in-plant recycle flows. The facilities are designed to treat peak flows of 50 mgd (2,690 L/s). The activated sludge facilities are designed to provide an effluent quality of 19 mg/L BOD_5 and 19 mg/L TSS.

1.5.3 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

In 1996, the Phase I Ponds Study (Boyle Engineering, 1996) was prepared as a preliminary feasibility study of pond treatment systems for secondary treatment at the SBIWTP. Seventeen pond-based wastewater treatment systems in the Southwestern United States were studied for performance and used to evaluate the use of pond treatment systems for secondary treatment. The study conclusions identified that both the Advanced Integrated Pond System (AIPS) and Completely Mixed Aerated (CMA) pond system would perform to specified standards and that AIPS would be preferred on the basis of its smaller aeration requirements. Two sites were evaluated and recommended for follow-up study: the Hofer site and the Spooner’s Mesa site.

In 1997, the Phase II Ponds Study (CH2M HILL, 1997) was conducted to evaluate the performance of AIPS types I and II and the CMA pond system at the Hofer and Spooner’s Mesa sites. The study found that both sites could be used for pond treatment systems that would meet the specified treatment levels. The selected pond system for the Hofer site was the CMA system. This system was subsequently modified per the recommendations of the Phase II Ponds Study to include certain features of the AIPS (see Appendix B5). The selected pond system for the Spooner’s Mesa site was the AIPS type II, hereafter referred to as AIPS.

This current alternative evaluates two treatment pond options capable of treating 25-mgd (1,095 L/s) average flow with peaks of 50 mgd (2,190 L/s). In this alternative, conventional primary treatment, as opposed to advanced primary treatment, is provided at the SBIWTP to fully optimize the pond system (see Phase II Pond Study). The primary effluent would be the influent to the pond systems. The wastewater would be treated in the pond system to a secondary or secondary-equivalent level. See Figure 1.3-2 for the location of both the Hofer and Spooner’s Mesa sites.

Figure

1.5-4 SBIWTP with Activated Sludge Secondary Treatment and Flow Equalization: System Operations

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Insert Figure

1.5-5 Activated Sludge with Flow Equalization Basin System Operations

(8 ½ x 11)

1.5.3.1 Completely Mixed Aerated System at the Hofer Site

The Hofer site comprises the Hofer parcel adjacent to the SBIWTP and a government-owned parcel north of the Hofer parcel. The physical layout of this system is shown in Figure 1.5-8. A schematic of the physical facilities required for the CMA at Hofer alternative is shown in Figure 1.5-9. This alternative would use a CMA process preceded by specialized cells called anaerobic digester pits (ADPs). This design incorporates recommended modifications to this alternative per the Phase II Ponds Study. The modifications are provided in Appendix B5. The proposed new facilities would require the following major elements:

- Four ponds, each divided into five cells: four ADPs receiving primary effluent, followed by one CMA cell receiving effluent from all of the ADPs. The ADPs will have surface aerators and the CMA cells will be completely mixed and aerated.
- Two surface aerated ponds (27 million gallons each) divided into two cells, each pond receiving effluent from the CMA cells
- Distribution structures
- Pump stations
- Control building

This alternative would cover a total area of approximately 36 acres (14.6 ha), with a total pond surface area of approximately 29 acres (11.7 ha). The proposed new facilities are sized to treat an average monthly organic loading of 370 mg/L BOD_5, and 350 mg/L TSS, and an average flow of 25 mgd (1,095 L/s) with a 50-mgd (2,190 L/s) peak. The system is designed to provide secondary effluent quality of 20 mg/L BOD_5 and 20 mg/L TSS with a total system capacity of 126.25 MG.

1.5.3.2 Advanced Integrated Pond System at Spooner's Mesa

The proposed new facilities for the AIPS at Spooner's Mesa alternative would require the following major elements:

- Six partially mechanically aerated ponds (200 MG total) with submerged anaerobic digester pits
- Six partially mechanically aerated ponds (100 MG total) with submerged anaerobic digester pits
- Three settling ponds (75 MG total)
- Distribution structures
- Pump stations
- Control building

Figure

1.5-6 SBIWTP with Increased Capacity of Activated Sludge Secondary Facility System Operations

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Insert Figure

1.5-7 Activated Sludge with Expanded Capacity: System Operations

(8 ½ x 11)

This alternative would cover a total area of approximately 102 acres (41.3 ha), with a total pond surface area of approximately 78 acres (31.6 ha). The physical layout of this system is shown in Figure 1.5-10. An operational schematic of the facilities required for this system is shown in Figure 1.5-11. These proposed new facilities are sized to treat an average month organic loading of 370 mg/L BOD_5 and 350 mg/L TSS and an average flow of 25 mgd (1,095 L/s) with a 50-mgd (2,190 L/s) peak. The AIPS treatment ponds are designed to provide secondary-equivalent effluent quality of 30 to 45 mg/L BOD_5 and 30 to 65 mg/L TSS.

This alternative will require new road construction and grading for construction and operational access to the Spooner's Mesa site. The new paved road would be constructed at an eastern access point for construction and operation of the AIPS. The proposed road is shown in Figure 1.5-12. A discharge pipe will be constructed from the ponds to the SBOO.

1.5.4 SBIWTP with Less than Full Secondary Effluent

This alternative involves two options for operating the SBIWTP with varying levels of primary treatment of wastewater coming from Tijuana. The first option involves the use of primary treatment only. The second option includes the use of partial activated sludge secondary treatment. Both options under this alternative would treat average flows of 25 mgd (1,095 L/s) and peaks above this amount up to 50 mgd (2,190 L/s).

1.5.4.1 SBIWTP with Advanced Primary Only

Under this alternative, the SBIWTP would operate using advanced primary treatment for average flows of 25 mgd (1,095 L/s) and peaks up to 50 mgd (2,190 L/s); no secondary treatment and no equalization of flow would be provided. This alternative represents the last phase of interim operating conditions of the SBIWTP as discussed in the Interim Operation SEIS. Pump Station One would be operated in a way that results in a daily peak flow of up to 50 mgd (2,190 L/s) and, combined with low flows, the average flow to the SBIWTP would equal 25 mgd (1,095 L/s).

The physical features associated with this alternative are shown in Figure 1.5-13. An operational schematic of the facilities required for the SBIWTP with advanced primary treatment is shown in Figure 1.5-14. This alternative would not require any new treatment facilities at the SBIWTP. The existing advanced primary facilities would treat an average monthly organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd (1,095 L/s) with a 50-mgd (2,690 L/s) peak. The advanced primary treatment is designed to provide an effluent quality of 204 mg/L BOD_5, and 88 mg/L TSS.

1.5.4.2 SBIWTP with Partial Secondary Treatment

This alternative involves the use of the SBIWTP with a 25-mgd (1,095 L/s) maximum flow for partial activated sludge secondary treatment; peaks over 25 mgd (1,095 L/s) and up to 50 mgd (2,190 L/s) would receive advanced primary treatment only. For this alternative, Pump Station One is assumed to be operated in a way that produces low flows and a daily peak flow of 50 mgd (2,190 L/s), such that the average flow to the SBIWTP equals 25 mgd

Figure

1.5-8 Physical Features of Completely Mixed Aerated (CMA) Ponds at Hofer Site Alternative

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Figure

1.5-9 CMA System at Hofer Site: System Operations

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Figure

1.5-10 Layout of the Advanced Integrated Pond System II at Spooner's Mesa Site

(8½ x 11 B / W)

Figure

1.5-11 Advanced Integrated Pond System at Spooner's Mesa: System Operations

(8-1/2x11)

Figure

1.5-12 Proposed Road Alignment at Spooner's Mesa

(8-1/2x11)

Figure

1.5-13 Physical Features for Advanced Primary and Partial Activated Sludge Secondary Alternatives

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Figure

1.5-14 SBIWTP with Advanced Primary Treatment Only: System Operations

(8-1/2x11)

(1,095 L/s). Accordingly, the average flow to the advanced primary portion of the plant is 25 mgd (1,095 L/s) and the average flow through the secondary process is only 18 mgd (788 L/s) because the secondary treatment facilities cannot handle flows greater than 25 mgd (1,095 L/s) at any given instant. Flows greater than 25 mgd (1,095 L/s) (up to 50 mgd [2,190 L/s]) would receive advanced primary treatment but would be bypassed around the secondary process to the SBOO (see Appendix B1, Conceptual Design of Flow Equalization Facility, for the determination of average secondary flow).

Physical features of the Partial Secondary Treatment alternative are shown in Figure 1.5-15. The proposed new facilities are the same as for the No Action alternative and, accordingly, would include the following major elements:

- Six single-pass, conventional, activated sludge tanks with fine bubble diffusers and anoxic zone "selectors," including one aeration blower structure with three blowers
- Eight secondary sedimentation tanks with return activated sludge pump facilities, secondary skimming pump station, and electrical local control center
- Two 27-foot-diameter (823-cm) dissolved air flotation thickeners with chemical addition facilities
- One 34-foot-diameter (1,036-cm) sludge storage tank
- Extension of the support facilities, such as yard piping, to accommodate the expanded site and facilities associated with the secondary treatment facilities

An operational schematic of the facilities required for the Partial Secondary Treatment alternative is shown in Figure 1.5-16. For an average month, these proposed new activated sludge and related facilities are sized to treat an organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd (1,095 L/s) plus in-plant recycle flows. The facilities are not designed to treat peak flows above 25 mgd (1,095 L/s). Because the activated sludge facilities will not treat more than 25 mgd (1,095 L/s) of flow, and because peak flows of 50 mgd (2,190 L/s) would enter the SBIWTP under this alternative, all flows above 25 mgd (1,095 L/s) would be bypassed around the activated sludge facilities. Thus the activated sludge facility would receive flows ranging from the lowest flows up to a maximum of 25 mgd, resulting in an average flow through the activated sludge facilities of 18 mgd (788 L/s). As a result, the final effluent quality would represent a blend of advanced primary effluent and activated sludge treated effluent, yielding a BOD_5 of about 71 mg/L and TSS of about 39 mg/L.

Figure

1.5-15 SBIWTP with Partial Activated Sludge Secondary Treatment: System Operations

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Insert Figure

1.5-16 Partial Secondary Treatment: System Operations

(8 ½ x 11)

1.5.5 Summary

Table 1.5-1 is a summary of the influent and effluent flows for all of the alternatives.

TABLE 1.5-1
INFLUENT AND EFFLUENT FLOWS FOR ALL ALTERNATIVES

Alternative	Average Flow to Primary	Peak Flow to Primary	Average Flow to Secondary	Peak Flow to Secondary	Average Flow through Outfall	Peak Flow through Outfall
No Action						
No Action/ Activated Sludge	25	25	25	25	25	25
SBIWTP with Activated Sludge Secondary Treatment						
Activated Sludge with Flow Equalization Basin	25	50	25	25	25	25
Activated Sludge with Expanded Capacity	25	50	25	50	25	50
SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment						
CMA at Hofer	25	50	25	50	25	50
AIPS at Spooner's Mesa	25	50	25	50	25	50
SBIWTP with Less than Full Secondary Effluent						
Advanced Primary Only	25	50	NA	NA	25	50
Partial Secondary Treatment	25	50	18	25	25	50

NA: Not Applicable
CMA: Completely Mixed Aerated System
AIPS: Advanced Integrated Pond System

1.6 Alternatives Considered but Eliminated from Further Consideration

This section presents the alternatives that were considered in the preparation of this SEIS but were subsequently eliminated from further consideration. They are: (1) Wastewater Reclamation; (2) Tertiary Treatment and the Water Factory 21 Process; and (3) Long-term Use of Mexico's Parallel Conveyance and Pump Station. Several other treatment alternatives were initially considered as part of the 1994 Final EIS but subsequently rejected. (These alternatives are described in the Preliminary Report for the SBIWTP prepared by Boyle Engineering for the U.S. Army Corps of Engineers, the SWRCB, and the City of San Diego [Boyle Engineering, 1991]). The alternatives and the reasons for rejecting them, as discussed in the 1994 Final EIS, are incorporated by reference in this SEIS. Additional pond alternatives were considered and eliminated as discussed in the Phase I and II pond studies.

The alternatives that were forwarded for full consideration in this SEIS were discussed during the public scoping meetings for the SEIS, as well as during other community meetings that were conducted throughout the SEIS process.

These alternatives were eliminated from further consideration because it was determined they would not provide reasonable and feasible methods for substantially accomplishing the objective of providing long-term treatment at the SBIWTP. The reasons for eliminating these alternatives from further consideration are discussed below in the context of each eliminated alternative.

1.6.1 Wastewater Reclamation

An alternative considered but eliminated is the reclamation of secondary treated effluent from the SBIWTP for reuse in Mexico for industrial and agricultural purposes. Wastewater reclamation was eliminated from further consideration as an alternative since all such proposals are in preliminary negotiations and because of the provisions outlined in Minute 283 (see Section 1.2.3.2 and Appendix A1).

Although the concept of reclamation was forwarded by the public during the scoping session for the SEIS, the most specific proposal was from a public/private partnership consisting of Agua Clara, LLC, and the State of Baja California, Mexico. The joint project, named "Bajagua" or "Water for Baja," would consist of a 6.8-mile (10.6-km) effluent-conveyance main that would follow the Rio Tijuana channel right-of-way. The conveyance system would connect the 25-mgd (1,095 L/s) advanced primary SBIWTP facility to a new wastewater treatment facility sited in the Rio Alamar area of Mexico. The facility of Rio Alamar would be a secondary, tertiary, and advanced water treatment facility for the primary effluent received from the SBIWTP. Effluent water quality would be determined on the basis of market demands for the type of water in relation to the costs of production.

The treatment technology for the new plant would be either an advanced lagoon system or a conventional activated sludge plant. If water markets were not developed at the scheduled pace, secondary treated effluent would be returned to the United States for disposal through the SBOO through a new pipeline. In addition to seeking NADBank's

Water Border Infrastructure funds for the proposed effort, the project sponsors would provide their own funds for the project. Currently, the project is still in the conceptual stage and the project sponsors are seeking BECC certification that may result in funding to develop the project.

Although an additional water supply source is needed for the City of Tijuana, the Bajagua proposal is currently not endorsed by the Mexican federal government. Mexico wastewater is considered the property of the Mexican federal government. Until EPA and USIBWC are requested by the federal Mexican government to consider this project, this proposal cannot be included as an alternative in the SEIS. Also, Minute 283, which was signed by both the United States and Mexico, specifically calls for construction of a 25-mgd (1,095 L/s) secondary international treatment plant in the United States and an ocean outfall to treat and dispose of Tijuana wastewater. Other options for treatment and disposal of Mexican wastewater were analyzed and rejected by the United States and Mexican governments during the treaty negotiations for Minute 283.

1.6.2 Tertiary Treatment and the Water Factory 21 Process

Tertiary treatment of the SBIWTP effluent was raised during scoping sessions for this SEIS. Specifically, an alternative similar to the Water Factory 21 process used at the County Sanitation Districts of Orange County (District) was proposed. The District sends 10 mgd (440 L/s) of treated wastewater to the Water Factory 21 for tertiary treatment that includes chemical clarification, recarbonation, multimedia filtration, carbon adsorption, chlorination, and reverse osmosis. The effluent quality resulting from this process meets drinking water standards. The District then injects the effluent into the groundwater basin.

The construction of a tertiary treatment facility with or without groundwater recharge is not a feasible alternative because of the infrastructure and facilities required for tertiary treatment and the associated costs of constructing such a facility. The costs associated with constructing a tertiary treatment facility would be prohibitively high. The addition of a reverse osmosis process alone could increase the capital costs of the SBIWTP by $75 million dollars and increase the annual operation and maintenance (O&M) costs by $19 million dollars (correspondence from SWRCB to EPA, April 1992). In addition, a large amount of land would be required for groundwater recharge.

1.6.3 Long-term Use of Mexico’s Parallel Conveyance and Pump Station

Another alternative considered by the lead agencies was the use of the SBIWTP with discharge back to Tijuana, Mexico, through a new conveyance system. The new conveyance canal would include the construction of a new pumping facility, force main, and conveyance canal running parallel to Tijuana’s existing facility. Ultimate discharge of the effluent would be at the surf in Mexico at Punta Bandera. CESPT, the wastewater utility agency for Tijuana, has obtained BECC certification for the construction of these facilities. The long-term purpose of this project is to provide a redundant system to Tijuana’s existing wastewater conveyance system (EPA, 1997).

This alternative would be a cost-effective option because it does not require the construction of any secondary facilities. In the Interim Operation SEIS, the use of this alternative as a discharge option was found to be feasible on an interim basis. Ocean modeling conducted as part of the previous SEIS, however, identified potential impacts from the discharge of advanced primary effluent at Punta Bandera. Northerly moving currents at the surf zone were found to potentially bring effluent into the United States that would exceed United States coliform standards. Ocean monitoring conducted in 1995 and 1996 by the City of San Diego indicated that these exceedances could be occurring from the Tijuana discharge. Any additional flows could exacerbate this situation. Furthermore, the federal government of Mexico has informed the IBWC that the new conveyance system could be used only on an interim basis until the SBOO is completed. Long-term use of the new conveyance system would have to be approved by the government of Mexico.

1.7 Preferred Alternative

A Preferred Alternative was not identified in this Draft SEIS. The Preferred Alternative will be identified in the Final SEIS. The lead agencies have concluded that additional review of the alternatives analyses is required to ensure proper consideration of environmental impacts. In addition, a preferred alternative will be selected after the lead agencies have had the opportunity to review the comments on the SEIS. Additional evaluation criteria will be used to in addition to the NEPA criteria to select the preferred alternative. (See Appendix G6 for a discussion of these criteria.)

Chapter 2
Affected Environment

This chapter provides a description of the existing environment in the vicinity of the SBIWTP from both a local and a regional perspective, as specified by NEPA (40 CFR 1502.15). Much of the discussion in this section has been summarized from the 1994 Final EIS (RECON, 1994) and the Interim Operation SEIS (RECON, 1996a, b). Environmental conditions that have changed since publication of these documents are identified in the appropriate resource area discussions in this chapter. The major changes in the affected environment of the project area include completion of the advanced primary wastewater treatment facilities at the SBIWTP and the ongoing construction of the SBOO. This chapter includes a description of the affected environment and takes into consideration these new projects. In addition, a discussion of two possible project locations for wastewater treatment ponds is included.

2.1 Water Resources

The following discussion is a summary of the water resources in the vicinity of the proposed project site, including a description of the area hydrology, flooding, and quality of the groundwater and surface water.

2.1.1 Watershed Description

The Tijuana River is an ephemeral stream draining an area of about 1,731 square miles (4,483 km^2), of which 470 square miles (1,217 km^2) (about 30 percent) are in the United States and 1,261 square miles (3,266 km^2) (about 70 percent) are in Mexico. The fan-shaped drainage area, which is shown in Figure 2.1-1, is about 75 miles (121 km) long and 50 miles (80 km) wide.

The Tijuana River is formed by the confluence of Cottonwood Creek (Rio El Alamar) and the Rio de las Palmas about 11 miles (18 km) southeast of the city of Tijuana. The river flows northward through a 6.6-mile (10.6-km) concrete flood-control channel in the Tijuana Municipality and~~Municipalityand~~ crosses the international boundary into California. For the USIBWC, the U.S. Army Corps of Engineers (1995) has constructed 0.5 mile (0.8 km) of concrete channel, 2.0 miles (3.2 km) of levees, and an energy dissipator immediately downstream of the international border. After the river crosses into the United States, it continues westward about 5.3 miles (8.5 km) and empties into the Pacific Ocean about 1.5 miles (2.4 km) north of the international boundary.

The Tijuana River can be characterized as a braided alluvial stream that shifts widely across the valley floor during flood stage. An alluvial floodplain forms the floor of the Tijuana River v~~V~~alley. North-trending ephemeral drainages from Mexico enter the valley at Canyon del Sol, Smuggler Gulch, and Goat Canyon. These physical features are shown in Figure 2.1-2.

Figure

2.1-1 Tijuana River Watershed

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Slipsheet

Figure

2.1-2 Surface Water Resources: North Draining Canyons and Tijuana River Estuary

(11 x 17)

Slipsheet

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Predominant soils along the Tijuana River belong to the Chino and Tujunga series. Chino soils have a considerable clay content, low infiltration rates, and higher available water-holding capacity. Tujunga soils are noted for high infiltration rates and low available water-holding capacity. Flood control structures and channelization between the international border and Hollister Street have diverted the river westward, away from Tujunga soils and into the finer silty loams of Chino soils.

The Tijuana River estuary is approximately 2,500 acres (1,012 ha) in size, is bisected by the Tijuana River into northern and southern arms, and is bounded by coastal uplands to the north and south, and the alluvial floodplain of the Tijuana River to the east. A 3-mile-long (5-km) barrier beach separates the estuary from the Pacific Ocean at its western boundary. From the estuary entrance channel, tidal flows are distributed by four channels.

The Tijuana River basin is classified as a Mediterranean, dry summer, subtropical climate. The average annual rainfall across the watershed ranges from about 11 inches (28 cm) near the coast to 25 inches (64 cm) at higher inland elevations, resulting in aquifer recharge of up to 4,500 acre-feet (5.5 Mm^3) of water in the 5,000-acre (2,023 ha) alluvial aquifer.

2.1.2 Surface Water

2.1.2.1 Hydraulics of the Tijuana River

The Tijuana River is an ephemeral stream characterized by low or no flow for many months each year in the United States. Intermittent flood flows are highly variable and are dependent upon rainfall quantity and intensity across the watershed. Brief periods of very high flows, primarily during the rainy season (November through April), are often followed by low or no summer flows. During periods of groundwater overdraft, surface waters provide recharge to the aquifer in direct proportion to the available storage. When the aquifer is full or overflowing, however, groundwater seepage into the lower Tijuana River creates “gaining” stream conditions. These conditions are apparent when ponds and stream flows in the valley are maintained in the absence of surface water input from Mexico.

According to the U.S. Geological Survey (Izbicki, 1985), the average annual discharge in the Tijuana River at the international boundary from 1936 through 1981 was approximately ~~about~~ 33,000 acre-feet / year (41 Mm^3 / year), compared to a “median” discharge of 659 acre-feet / year (0.8 Mm^3 / year). The maximum annual discharge was recorded during the 1979 to 1980 water year when 586,000 acre-feet (723 Mm^3) flowed through the lower Tijuana River valley~~Tijuana River Valley~~ (Izbicki, 1985).

A hydraulics study to determine the low-flow characteristics of river flows was conducted (Boyle Engineering, 1996). Flow rates ranging from 1.7 mgd (74.5 L / s) to 34.8 mgd (1,525 L / s) have been modeled to determine the travel times from Stewart’s Drain to the Tijuana River estuary for the selected flows. The predicted travel times vary from a minimum of 4.6 hours at 34.8 mgd (1,525 L / s) to a maximum of 14.4 hours at 1.7 mgd (74.5 L / s).

2.1.2.2 Flood Peaks

Flood peaks on the Tijuana River show extreme annual variability. Peak flow events were estimated for the period between 1884 and 1937 by the U.S. Army Corps of Engineers, and peak flow events were measured between 1937 and 1984 (Philip Williams & Associates, 1987). During these periods, the highest estimated historical flow occurred in 1916, with an estimated peak flow of 75,000 cfs (2,124 m^3/s). An event of this magnitude is expected to have approximately a 1-percent chance of occurring in any given year (Philip Williams, 1987). During the floods of 1993, an equivalent flow of 33,000 cfs (2,100 m^3/s) was recorded in the Tijuana River at the United States-Mexico border.

In the 1970s, Mexico constructed a concrete flood control channel from the international border upstream approximately 6.5 miles (10.6 km) to the confluence with Rio El Alamar. The channel was designed to convey up to 500-year flood flows of 13~~2~~5,000 cfs (~~3~~4,8~~5~~20~~0~~ m^3/s). The channel has 3 feet (1 meter) of freeboard. The U.S. constructed an energy dissipator at the downstream end of the flood channel. Mexico has designed and completed environmental review to extend the flood control channel upstream an additional 4 miles (6.5 km) to below the Abelardo L. Rodriguez Reservoir. This project will control flooding for approximately 1,034 acres (422 ha) of the floodplain. In addition to providing additional flood protection in Mexico, the channel extension will address problems of surface and groundwater contamination.

As part of the development of the SBIWTP, the south levee of the Tijuana River in the United States~~.S .~~ has been modified to protect the SBIWTP from flood flows. Additional modifications to the floodplain and low-flow channel are proposed by the City of San Diego for its South Bay Treatment Plant adjacent to the SBIWTP site and Dairy Mart Road bridge-crossing improvements to accommodate a 333-year flood.

2.1.2.3 Surface Water Quality of the Tijuana River Estuary

During wet weather, river flows through Tijuana are degraded by sewage, affecting the water quality of the Tijuana River in the United States and U.S. coastal waters. Various studies have been conducted to assess the water quality of the Tijuana River estuary. A study by Gersberg, Trintade, and Nordby (1989) found that, despite continued inflow of sewage containing heavy metals, elevated levels of only cadmium were found in the sediments of both the Tijuana River and southern estuary sites. The study also concluded that only lead was found in levels above an international standard in fish. These levels, however, do not pose a significant public health risk. In contrast, Zedler et al. (1986) found that soils in the marsh habitats near the estuary's main channels, downstream of Goat Canyon and in the Oneonta Slough, are contaminated with heavy metals.

2.1.3 Groundwater

2.1.3.1 Groundwater in Tijuana River Valley

Groundwater in the lower Tijuana River v~~V~~alley occurs in three zones: (1) beneath the Nestor Terrace north of the valley, (2) in the alluvial fill underlying the Tijuana River v~~V~~alley, and (3) in the San Diego Formation beneath the alluvium (TJVCWD, 1994). Of these three zones, the Tijuana River valley alluvium has been studied and used the most.

The Tijuana River v~~V~~alley aquifer is recharged primarily by direct rainfall, subsurface inflow from adjacent areas, and intermittent flood flows (State of California, 1967; U.S. Army Corps of Engineers, 1990; Rempel, 1992). Surface flows in the river may also provide groundwater recharge (Dudek and Associates~~TJVCWD~~, 1994). The amount of groundwater inflow from across the international border has been estimated by various sources at 1,580 acre-feet/year (2.0 Mm^3/year) (State of California, 1952); 1,208 acre-feet/year (1.5 Mm^3/year) (USACE, 1965); and 1,160 acre-feet/year (1.4 Mm^3/year) (USIBWC, 1976). There is also potential recharge from water-bearing zones east of I-5 that has not been estimated.

The chief factors contributing to the reduction of groundwater in storage are agricultural pumping and evapotranspiration from phreatophytes (i.e., deep-rooted plants notable for their ability to obtain water from groundwater or the overlying capillary fringe). There is the possibility of minor outflow from the basin toward the north during periods of high groundwater. The amount of groundwater discharging either directly to the ocean or to the lower reaches of the river has been estimated to be 2,090 acre-feet/year (2.6 Mm^3/year) during dry years and 2,827 acre-feet/year (3.5 Mm^3/year) during wet years (Dudek and Associates, ~~(TJVCWD,~~ 1994).

It is only when the amount of groundwater removed from a basin chronically exceeds natural recharge from rainfall, subsurface inflow, and intermittent flood flows that the groundwater table levels will begin to decline. The record for the lower Tijuana River v~~V~~alley from 1965 to 1978 shows that groundwater levels can recover from drier-than-normal rainfall and less-than-normal runoff as long as groundwater extraction is reduced. This observation is supported by data collected between 1965 and 1978.

2.1.3.2 Groundwater Quantity and Quality

Depending on stream flow, accumulated rainfall, and groundwater pumping, water table elevations vary from year to year and between wet and dry seasons. Sustained high rates of groundwater extraction during the 1950s resulted in a decline in groundwater levels of 23 to 30 feet (7 to 9 m) or more in the Tijuana River v~~V~~alley. By the early 1960s, groundwater table elevations across much of the valley had fallen below sea level, resulting in the intrusion of seawater and highly saline groundwater from underlying and adjacent marine sediments into the alluvial aquifer (State of California, 1975; Rempel, 1992). By 1967, seawater intrusion had affected most wells up to the United States-Mexico border. This saltwater degradation of the aquifer contributed to the declining demand for groundwater from the Tijuana River v~~V~~alley. As rates of natural recharge exceeded rates of consumption, the resulting annual surplus of water began to overcome years of accumulated deficits, and water levels began recovering.

Increased annual precipitation and runoff between 1978 and 1984, and greatly reduced groundwater pumping for irrigation since 1970 appear to have raised the groundwater levels to within 0 to 15 feet (0 to 5 m) of the ground surface throughout the river floodplain (Philip Williams, 1987; Rempel, 1992). Groundwater levels at the SBIWTP site have been reported to be between 28.5 to 35 feet (8.7 to 10.7 m) mean sea level (MSL) (Woodward-Clyde, 1994). The SBIWTP elevation is about 50 feet (15.2 m) MSL.

Today, the quality of groundwater in the Tijuana River v~~V~~alley is still characterized by high levels of sodium chloride and total dissolved solids (TDS). These high salinity levels prevent the current use of well water for the irrigation of salt-sensitive crops cultivated within the valley. As a result of lowered groundwater levels and seawater intrusion, groundwater TDS concentrations along the coast have exceeded 27,000 milligrams per liter [mg/L] (the TDS content generally ranges between 1,000 and 1,500 mg/L). In the Department of Water Resources Bulletin 106-2 (State of California, 1967), the Tijuana River v~~V~~alley groundwater was rated generally inferior for domestic use because of its high sulfate and high fluoride concentrations. It was also rated generally inferior for irrigation purposes because of high electrical conductivity, high chloride levels, and high percentage of sodium in the vicinity of Spooner's Mesa. In addition to seawater intrusion problems, the poor quality of the groundwater is also attributed to sodium chloride leaking from the San Diego Formation, irrigation return, and groundwater movement from beyond the international boundary (EPA, 1988).

Nevertheless, the Water Quality Control Plan for the San Diego Basin designates municipal and domestic supply, agricultural supply, and industrial service supply as beneficial uses for the groundwater east of Hollister Street. The area, however, is exempt from the sources of drinking water policy (State of California, 1995) and the beneficial uses do not apply to areas west of Hollister Street.

2.1.3.3 Groundwater Quality of the Tijuana River Estuary

The U.S. Army Corps of Engineers (1990) initiated a groundwater sampling program in July 1990 for the Tijuana River estuary. Test results indicated that there were no toxic effects to fish, even at full concentration, and no observable effect on shrimp at a 2:1 dilution.

2.1.4 Oceanography

2.1.4.1 Regional and Local Currents

The currents along the California coast, which are shown in Figure 2.1-3, are dominated by the offshore, southward-flowing California current. The position and intensity of the California current vary with the season and typically shift onshore in the spring and summer with the advent of the persistent northwesterly winds. The countercurrent flows northward at a depth of 90 feet (28 m) from Baja California, and transports warm, high-salinity Equatorial Pacific water northward. Coastal currents within the California system interact with seasonal upwelling events that bring cool, dense water to the surface and influence the dynamics of the flows.

The South Bay region is characterized as a coastal bight and extends from Point Loma to far northern Baja. The coastal currents in this southern coastal region were measured for a 24-month period between 1986 and 1988 for the Tijuana Oceanographic Engineering Study (TOES) (Engineering Science, 1988). The mean flow was measured by current meters in 15 stations in U.S. and Mexican waters. This current meter data were augmented by satellite imagery and other studies (drogue release studies).

Modeling of the flow patterns was conducted by Hendricks (1988). The mean flow pattern for the first 12 months was predominately to the south. The principal pattern was found to be a relatively uniform longshore flow north and south along the coastline, representing ~~about 60 to 65 percent in the variance in current measurements. A second, intermittent flow~~

Figure

2.1-3 Oceanographic Features

8 1/2 x 11

Slipsheet

about 60 to 65 percent in the variance in current measurements. A second, intermittent flow pattern consists of a recurring eddy with counterclockwise circulation south of Point Loma of varying intensity that can extend 6.2 to 9.3 miles (10 to 15 km) offshore and approximately 10.6 miles (17 km) alongshore. About 87 percent of the variability in current meter data is accounted for by these two patterns. The combined flows from these two current patterns are shown in Figure 2.1-4.

Shoreline circulation is predominantly influenced by waves. Northerly swells occur during late fall, winter, and early spring as a result of northerly storms, while southerly swells occur during summer and fall as a result of tropical storms and wind patterns. Wave data from an Imperial Beach monitoring station indicate that the predominant wave direction is from the west to southwest, with a nearly continuous northern transport through the Imperial Beach area and along the Silver Strand.

The IBWC monitoring data indicated that the discharge from Punta Bandera in Mexico remains close to the shoreline. Only at depths of less than 3 feet (0.91 m) and inshore of the 30-foot (9.1-m) contour were effects from the Punta Bandera discharge registered. This is the basis of the assumption that the Punta Bandera discharge will not affect the ambient water quality at the location of the SBOO.

2.1.4.2 Ocean Floor Composition

South Bay shores are characterized by sand beaches, wave-cut rocky platforms, and gravel boulder beaches. Along the ocean floor, soft bottom habitat characterizes the alignment of the South Bay outfall, with a short stretch of cobble bed at a depth of about 55 feet (16.8 m). Coarse shell debris was observed along the outfall alignment from 50 to 80 feet (15.3 to 24.4 m) deep, with finer sediments inshore and offshore (Kinnetic Laboratories, 1990). A study area 1 mile north and parallel to the outfall alignment indicated significantly more low-relief rocks, boulders, and cobbles from approximately 48 feet (14.6 m) out to 90 feet (27.5 m) in depth.

2.1.4.3 Seawater Characteristics

The ambient seawater density profile in the vicinity of the diffuser portion of an ocean outfall determines the trapping depth of an effluent plume. The relative difference between ambient and effluent density dictates how effective mixing would be near the diffuser outlets. Because of this, the vertical density distribution in the water column plays an important role in determining the amount of initial dilution that can be achieved.

In general, seawater density varies on a seasonal basis and in response to short-term, large-amplitude tidal and internal waves that can cause major perturbations in the density profile. In the South Bay region, the water column was found to be well mixed during winter months. During the summer, the water column tends to be stratified by water temperature and density at depths between 33 and 65 feet (10 and 20 meters). Water quality data from July 1995 to June 1996 are presented in the TOES (Engineering Science, 1988).

~~Figure~~

~~2.1-3 Oceanographic Features~~

~~8 1/2 x 11~~

~~Slipsheet~~

Figure

2.1-4 TOES Model Current Patterns

(8-1/2 x 11)

Slipsheet

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In 1995 and 1996, the lead agencies conducted baseline monitoring of ocean conditions in the area that would receive treated effluent from the SBIWTP (baseline monitoring) (City of San Diego, 1996). ~~See~~ (See Appendix C ~~C~~ for baseline monitoring locations.) The monitoring was conducted in each of the following areas: water quality, benthic communities, epibenthic species, tissue burden (chemical constituents in fish tissue), and toxicity. The sampling area extended from the tip of Point Loma to Punta Bandera in Baja California, and from the shoreline out to sea at a depth of about 200 feet (61 m). Sampling included monthly water column profiles of physical parameters and discrete samples for coliform, oil and grease, and total suspended solids (TSS). Sediment samples were taken for infaunal assessment and for the physical and chemical characteristics of the sediment. Otter trawls (nets) identified demersal (free swimming) fish and macrobenthic communities.

Targeted fish species were used for the tissue burden analyses. Bioassays were used to determine ambient toxicity.

Monitoring showed that the coliform levels at the shoreline were most affected by wastewater discharged from the San Antonio de los Buenos Wastewater Treatment Plant in the southernmost region of the monitoring area and from wet weather runoff through the Tijuana River. Offshore, the coliform levels were at acceptable levels, but were occasionally affected by discharges from Punta Bandera. Coarse sediment assemblages typified the benthic communities. There was little evidence of any anthropogenic influence. Fish assemblages were notable for the low numbers of both species and abundance. Macroinvertebrates were also relatively low in the number of species and abundance. The levels of chemical constituents detected in fish tissues fell within the range of levels detected throughout the Southern California bight. Various trace metals were the most common compounds detected. DDT, polychlorinated biphenyls (PCBs), and other chlorinated pesticide concentrations were very low. Bioassays measured showed that the least ambient toxicity was recorded at monitoring stations closest to the proposed discharge site.

2.1.4.4 Marine Water Quality/Sediment Quality

Waste discharges can increase levels of chemical constituents in the water column, sediments, and body tissues of marine organisms. Sediments and the water contained within sediments are often more directly affected by ocean discharges, because sediments act as a repository for particulate materials that settle to the bottom. As solids settle out from the effluent plume in the ocean, the accumulation of nutrients and chemicals in the sediments tends to alter biological communities that are present. High concentrations of organic matter and inorganic nutrients from municipal wastes can stimulate bacterial and phytoplankton growth, leading to oxygen depletion. This results in a reduction of species diversity and abundance of benthic fauna. The marine resources of the South Bay area are described in more detail in Section 2.2.2. Water quality data for July 1994 and 1995, and constituent levels for temperature, salinity, dissolved oxygen (DO), pH, transmissivity, and density are presented in the TOES (Engineering Science, 1988).

During the baseline monitoring undertaken between July 1995 and June 1996, mean bottom water temperatures at the 90-foot (27-m) depth stations increased from 51.6° F (10.9° C) in July to 57.7° F (14.3° C) in December and declined thereafter to a range of 51.8° F to 55.4° F (11.0° C to 13.0° C) in the winter and spring months. Mean surface temperature increased from 62.4° F (16.9° C) in July to 71.4° F (21.9° C) in September, and declined to 57.6° F (14.2° C) in February. In May and June, mean surface temperatures began to rise to 51.6° F (10.9° C) and 68.9°F (20.5° C), respectively.

During the baseline monitoring, mean salinity values were highest in July and August 1995, and April through June 1996. Upwelling appeared to cause high mean salinity values. Maximum thermal stratification was observed in June 1996, when surface and 180-foot (55-m) deep values were 33.71 parts per thousand (ppt) and 33.83 ppt, respectively. In December, the range of salinity values was narrow and inverted, with a value of 33.44 ppt at the surface and 33.38 ppt at 180 feet (55 m). There were insufficient data to explain the inversion, and upwelling did not appear to be a factor.

Dissolved oxygen values decreased during the baseline monitoring with depth and distance from shore, and mean values were highest during the summer and fall. At the 90-foot (27-m) depth contour, mean values in summer ranged from 7.7 mg/L ~~mg/L~~ in July to 8.8 mg/L in August and September. A high mean value of 8.9 mg/L was recorded in October. Dissolved oxygen values declined in winter and increased again in the spring with the exception of April, when the lowest value of 6.9 mg/L occurred as a result of an upwelling.

In the baseline monitoring, annual means for suspended solids ranged from 3.37 mg/L at Station I-13 to 7.90 mg/L at Station I-19. The highest values of suspended solids occurred at the 30-foot (9-m) stations, where wave activity is suspected of causing increased resuspension of sediments into the water column. Values decreased to 3.0 to 4.0 mg/L at all other stations, and no north-south trends were apparent.

Regionally, nutrient concentrations in seawater, both dissolved and particulate, are generally low. Seasonal variations in DO concentrations and pH levels have been found to be consistent with the rest of the California bight.

In the baseline monitoring, sediments were found to be relatively coarse at all stations throughout the study area, with sands and silts comprising 89 percent and 10 percent of the sediments, respectively. Clays accounted for less than 1 percent of the sediments. Sediments in the San Diego Regional Ocean Monitoring Station averaged 121 feet (37 m) in depth, and ranged from 89 to 152 feet (27 to 46 m) deep. The sediments averaged 97 percent sand and 3 percent silt and clay.

Sediment samples from the TOES (Engineering Science, 1988) have shown that organic carbon, biological and chemical oxygen demand, sulfides, total nitrogen, arsenic, lead, nickel, zinc, copper, chromium, cyanide, and DDT are highest in the northwest areas of the bay. Sediments were highest in mercury, cadmium, silver, and phenol in the central areas of the bay, and adjacent to the Tijuana estuary, higher sediment concentrations were found for nickel, zinc, copper, chromium, and DDT. The average sediment chemistry data are shown in Table 2-3 of the TOES (Engineering Science, 1988).

The SWRCB has conducted a State Mussel Watch (SMW) program since 1977 throughout California (State of California, 1988). This program maintains a station in the South Bay area. The program establishes “elevated data levels” (EDLs) for trace metals and organics. The EDLs are the concentrations of a toxic substance in a mussel that equal or exceed a specified percent of all SMW measurements of the toxic substance in the same mussel type between 1977 and 1987. Although trace metals were found in tissues of mussels at all stations, no EDLs were reported in mussels collected from the South Bay area.

At an ocean disposal site located approximately 5 miles (8 km) downcoast of Point Loma, sediments range from sandy silt to silty clay. The disposal site has been used by the U.S. Navy and San Diego Bay shipbuilders since 1977 and was permitted for disposal of more than 3 million cubic yards (2.3 million cubic meters) of sediment. Measured sediment metals were characteristically within the range of values for the Southern California shelf reported by Chow and Earl (1977). Measured values of sediment oil and grease (90 ppm) and DDT (3 ppb) were elevated above reference site values, but fell well below values associated with wastewater outfalls. PCB data were inconclusive because levels were below detection limits for many sediment samples. PCBs were slightly elevated above reference site values in other samples. Water samples analyzed for trace metals and hydrocarbons resulted in undetected compounds.

2.1.5 Surface, Groundwater, and Marine Water Quality~~ – ~~—Mexico

2.1.5.1 Surface Water Quality

The physical surface water conditions south of the project site in Mexico are similar to and do not differ substantially from those discussed previously for U.S. surface waters. Construction and implementation of facilities associated with the alternatives~~the proposed project~~ are not anticipated to affect surface water resources of the Tijuana Municipality or environs because all facilities would be built downstream in the United States. Therefore, the specific nature and attributes of the current Tijuana / Mexican surface water environment have not been addressed or quantified further within this~~the present~~ SEIS.

2.1.5.2 Groundwater Quality

The physical groundwater conditions south of the project site in Mexico are similar to and do not differ substantially from those discussed for U.S. groundwater resources. Construction of facilities associated with the alternatives~~proposed project~~ is not anticipated to affect groundwater resources of the Tijuana Municipality or environs. Groundwater resources could potentially be affected by a sludge disposal facility but the Mexican government has not yet selected a disposal site. Therefore, the specific nature and attributes of the current Tijuana / Mexican groundwater environment have not been addressed or quantified further within this~~the present~~ SEIS.

2.1.5.3 Marine Water Quality

The physical oceanographic conditions south of the ocean outfall site extending into Mexican waters are similar to and do not differ substantially from those discussed previously for U.S. marine waters. As noted in Section 2.1.4, a countercurrent flows northward at a depth of 90 feet (27.5 m) from Baja California. The California current itself turns shoreward offshore of northern Baja California, resulting in an eddy flow within the Southern California bight. Coastal currents in Mexican waters were measured between 1986 and 1988 for the TOES (Engineering Science, 1988). Shore types found south of the border in Baja are typically wave-cut rocky platforms and gravel beaches.

At the present time, untreated wastewater exceeding the capacity of the San Antonio de los Buenos wastewater treatment plant is released to the Pacific Ocean at Punta Bandera. On average in 1997, 7 mgd of untreated sewage was discharged at Punta Bandera based on flow data provided by the CESPT. These untreated sewage discharges currently affect the existing aquatic environment by introducing bacteria, viruses, and toxic or carcinogenic constituents. Wastewater conveyed to San Antonio de los Buenos is discharged at the beach 5.6 miles (9 km) south of the international border. Waves and currents mix the discharge with ocean water in the surf zone, which extends from the beach out to the breaker line. This mixing dilutes the discharged water and reduces the concentration of pollutants (EPA, 1997).

As part of the International Wastewater Treatment Plant Baseline Ocean Monitoring Report (City of San Diego, 1996), water quality monitoring data were examined for temporal and spatial trends with respect to temperature, salinity, transmissivity, and dissolved oxygen. Water samples were taken at nine shoreline stations located near Punta Bandera in Mexico north to a site at Avenida del Sol next to the Hotel del Coronado in the United States beginning in October 1995. Offshore stations were established at the same time to sample water around the future outfall site and the area inshore to a depth of 30 feet (9 m). The offshore sampling area encompassed approximately 140 square nautical miles (479 km^2) and included 38 water quality stations.

Monitoring results show that the San Antonio de los Buenos discharge site affects bacterial densities in Mexico and just north of the international border. The mean annual coliform density near San Antonio de los Buenos was 2,513 CFU per 100 mL between July 1995 and June 1996, while the mean annual coliform density near the international border was 1,473 CFU per 100 mL for the same period. In contrast, , offshore stations generally had very low coliform densities throughout the year. Only the 30-foot (9-m) offshore stations showed much effect of the San Antonio de los Buenos discharge site. Total coliform densities decreased with increasing distance north from San Antonio de los Buenos; mean coliform bacterial densities at all other offshore stations were insignificant and near the detection level. Overall, there was a gradient of decreasing coliform densities with increasing distance north of the San Antonio de los Buenos discharge site, which is consistent with known water circulation patterns.

Differences in temperature, transmissivity, levels of suspended solids, and levels of oil and grease were due to seasonal changes, rather than differences based on location; levels of oil and grease were very low at all stations throughout the study period. Changes in salinity were also related to season rather than location, and were inversely related to temperature.

Dissolved oxygen values decreased with depth and distance from shore, and mean values were highest during the summer and early fall. At the 90-foot (27-m) depth contour, mean values in summer ranged from 7.7 mg/L in July to 8.8 mg/L in August and September. A high mean value of 8.9 mg/L was recorded in October. Dissolved oxygen values declined in winter and increased again in the spring, with the exception of April when the lowest value of 6.9 mg/L occurred as a result of upwelling. However, high values of 8.0 mg/L or greater were found around the Tijuana River mouth during summer and spring quarters, and lower dissolved oxygen values were found at the north and south extremes of this area during the spring quarter of sampling.

A study conducted by Wilhelmy and Flegal (1991) measured the concentration and distribution of trace elements from Baja California to the U.S.-Mexico border. Those trace element studies included lead, cadmium, manganese, iron, and zinc. The study also investigated the relative contributions that human activity and natural processes make towards the trace element concentrations and their distribution.

Marine surface water was sampled from 11 stations along four transects off Baja California. Stations located along the US-Mexico border and near Punta Bandera had elevated trace metal concentrations compared with more southerly locations. Trace metal concentrations showed both onshore and longshore gradients associated with high salinity and high nutrient concentrations. Nearshore stations were relatively enriched with trace metals compared with more southerly locations, but the values were oceanographically consistent with levels previously reported for the northeast Pacific (upwelled waters). This indicates that, although this area receives high loading of trace metals through wastewater discharges, this loading may not be the predominant factor affecting trace metals distribution. The study suggests that 1 percent of cadmium, 9 percent of zinc, and 29 percent of lead concentrations in marine surface waters in this area originate from point source discharges. This estimate of the relative contribution of trace elements into the California current system by human activities is restricted to contributions from this area and does not include contributions from non-point sources, or human contributions from point sources, outside the Southern California bight.

Projected concentrations of pollutants in the discharge at Punta Bandera are difficult to estimate because of the planned rehabilitation of San Antonio de los Buenos. This rehabilitation is expected to improve plant efficiency. T~~; however, t~~his efficiency, however, will vary by pollutant and is difficult to evaluate without empirical data from the rehabilitated plant. Because of this uncertainty, conservative estimates of pollutants in the San Antonio de los Buenos discharge have been used to identify pollutants with possible occurrences above Ocean Plan limits. No removal was assumed in order to provide a preliminary evaluation of compliance. (EPA, 1997)

2.2 Biological Resources

This section summarizes the biological resources in the vicinity of the SBIWTP. Descriptions of the vegetation and wildlife in the area and summaries of recent field activities conducted since publication of the 1994 Final EIS (RECON, 1994) are given in Appendix E.

2.2.1 Terrestrial Biological Resources

This section describes the terrestrial biological resources at the proposed project sites. Data about the SBIWTP and Hofer site are summarized from information provided in the 1994 Final EIS. Data for Spooner's Mesa are summarized from the Interim Operation SEIS (RECON, 1996a,b) and from field studies and the Addendum to the Biological Assessment (Appendix E) that was completed after the publication of the Interim Operation SEIS.

2.2.1.1 SBIWTP and Hofer Site

The SBIWTP site is disturbed as a result of existing facilities constructed in support of primary wastewater treatment. The Hofer site is disturbed from current and past agriculture, gravel extraction, vegetation clearing, and livestock activities. (These sites are shown in Figure 2.2-1.) No patches of native vegetation remain within the site boundary.

Figure

2.2-1 Biological Resources - SBIWTP Site and Vicinity

(1 of 2)

(8-1/2 x 11)

Slipsheet

Figure

2.2-1 Biological Resources - SBIWTP Site and Vicinity

(2 of 2)

(8-1/2 x 11)

Slipsheet

Vegetation growing within the floodplain is currently managed by periodic mowing to control floodwaters and to assist the Border Patrol. Some areas in the floodplain are temporarily vegetated with scattered young willows, mule fat species, and various herbaceous species between mowing activities.

Sensitive plant species found in the vicinity of the SBIWTP and the Hofer site include San Diego barrel cactus, San Diego marsh-elder, ashy spike-moss, and San Diego sunflower. No sensitive plant species occur within the Hofer site or the SBIWTP site. Sensitive wildlife observed in the general vicinity include least Bell's vireo, coastal California gnatcatcher, black-shouldered kite, northern harrier, red-tailed hawk, red-shouldered hawks, and Caspian tern. None of these animal species is expected to nest within the SBIWTP's boundary or on the Hofer site because of the lack of suitable habitat. The vegetative communities and the sensitive species in this area are shown in Figure 2.2-1.

2.2.1.2 Spooner's Mesa

Spooner's Mesa is located along the United States-~~/~~Mexico border approximately 1.5 miles (2.4 km) inland from the Pacific Ocean. The topography of the mesa is characterized by steep slopes and a gently undulating top. The top of the mesa is irregular in shape, covers approximately 136 acres (55 ha), and ranges in elevation from 269 to 406 feet (82 to 124 m) above mean sea level. Many dirt roads and trails cover the top of the mesa. The U.S. Border Patrol uses these roadways on a regular basis. The vegetation and wildlife in this area are discussed below and shown in Figure 2.2-1. To the east and west of Spooner's Mesa lie drainages that drain higher elevation areas to the south. Smuggler Gulch is located to the east and Goat Canyon to the west (see Figure 1.3-2 for the features described in this paragraph).

Vegetation

Vegetation and vegetation communities in the vicinity of Spooner's Mesa include coastal sage scrub, nonnative grassland, disturbed floodplain, and disturbed habitat.

Diegan Coastal Sage Scrub. Diegan coastal sage scrub habitat surrounds the slopes of Spooner's Mesa. This habitat community is dominated by low, soft-woody shrubs that are typically drought deciduous. Coastal sage scrub usually occupies drier south- and west-facing areas on clay soil types. Areas disturbed frequently that have not converted to annual grasslands can be dominated by more open stands of coastal sage scrub species.

The dominant plant species of the Diegan coastal sage scrub community in the project area are coastal sagebrush, flat-top buckwheat, San Diego sunflower, bladder pod, and California encelia. Disturbed areas within this community type tend to be dominated by flat-top buckwheat or annual grasses and herbs. Evergreen species such as lemonade-berry and laurel sumac occur occasionally in the coastal sage scrub matrix but are more common along the drainages.

~~Figure~~

~~2.2-1 Biological Resources - SBIWTP Site and Vicinity~~

~~(1 of 2)~~

~~(8-1/2 x 11)~~

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~~Figure~~

~~2.2-1 Biological Resources - SBIWTP Site and Vicinity~~

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~~Vegetation growing within the floodplain is currently managed by periodic mowing to control floodwaters and to assist the Border Patrol. Some areas in the floodplain are temporarily vegetated with scattered young willows, mule fat species, and various herbaceous species between mowing activities.~~

~~Sensitive plant species found in the vicinity of the SBIWTP and the Hofer site include San Diego barrel cactus, San Diego marsh-elder, ashy spike-moss, and San Diego sunflower. No sensitive plant species occur within the Hofer site or the SBIWTP site. Sensitive wildlife observed in the general vicinity include least Bell's vireo, coastal California gnatcatcher, black-shouldered kite, northern harrier, red-tailed hawk, red-shouldered hawks, and Caspian tern. None of these animal species is expected to nest within the SBIWTP's boundary or on the Hofer site because of the lack of suitable habitat. The vegetative communities and the sensitive species in this area are shown in Figure 2.2-1.~~

~~2.2.1.3 Spooner's Mesa~~

~~Spooner's Mesa is located along the United States/Mexico border approximately 1.5 miles (2.4 km) inland from the Pacific Ocean. The topography of the mesa is characterized by steep slopes and a gently undulating top. The top of the mesa is irregular in shape, covers approximately 136 acres (55 ha), and ranges in elevation from 269 to 406 feet (82 to 124 m) above mean sea level. Many dirt roads and trails cover the top of the mesa. The U.S. Border Patrol uses these roadways on a regular basis. The vegetation and wildlife in this area are discussed below and shown in Figure 2.2-1. To the east and west of Spooner's Mesa lie drainages that drain higher elevation areas to the south. Smuggler Gulch is located to the east and Goat Canyon to the west (see Figure 1.3-2 for the features described in this paragraph).~~

~~2.2.1.2.1 Vegetation~~

~~Vegetation and vegetation communities in the vicinity of Spooner's Mesa include coastal sage scrub, nonnative grassland, disturbed floodplain, and disturbed habitat.~~

~~**Diegan Coastal Sage Scrub.** Diegan coastal sage scrub habitat surrounds the slopes of Spooner's Mesa. This habitat community is dominated by low, soft-woody shrubs that are typically drought deciduous. Coastal sage scrub usually occupies drier south- and west-facing areas on clay soil types. Areas disturbed frequently that have not converted to annual grasslands can be dominated by more open stands of coastal sage scrub species.~~

~~The dominant plant species of the Diegan coastal sage scrub community in the project area are coastal sagebrush, flat-top buckwheat, San Diego sunflower, bladder pod, and California encelia. Disturbed areas within this community type tend to be dominated by flat-top buckwheat or annual grasses and herbs. Evergreen species such as lemonade-berry and laurel sumac occur occasionally in the coastal sage scrub matrix but are more common along the drainages.~~

Coastal sage scrub communities often have large openings in the brush that are characteristically dominated by native grasses and herbs. Rocky areas in these gaps, especially on the ridges, can have small populations of cacti such as coast barrel cactus, coast cholla, and fish-hook cactus.

Nonnative Grassland. The top of Spooner's Mesa has been farmed and disked in the past but is currently fallow and supports sparse nonnative grassland habitat. This habitat designation refers primarily to areas that have been disturbed by agriculture, grazing, brush clearing, or frequent fires resulting in the establishment of an annual grassland. Although grasses and herbs dominate this habitat, several shrubs occur in areas that are either recovering from past disturbances or are not intensely utilized. The grass species predominantly found in disturbed areas are red brome, slender wild oat, smooth brome, and ripgut grass. Weedy herbaceous species include black mustard, sweet fennel, filaree, scarlet pimpernel, tocolote, dove weed, and cat's ears. Occasional shrubs of chaparral broom, white sage, flat-top buckwheat, and coast golden bush occur in less disturbed areas.

Disturbed Floodplain. Small patches of disturbed floodplain occur at the base of the west slopes of Spooner's Mesa in Goat Canyon. This vegetation community designation is not a formal plant community type; rather, it represents a recovery phase of a disturbed plant community. The floodplain of the Tijuana River east of the SBIWTP is actively managed to reduce vegetation cover for flood control and illegal border crossings. Portions of the entire floodplain in the valley have been disturbed from agricultural practices.

Smuggler Gulch is east of Spooner's Mesa. The SBLO crosses Smuggler Gulch further to the north and across Monument Road. This intersection is where the pipeline from the SBIWTP to Spooner's Mesa would also cross Smuggler Gulch. The City of San Diego removes vegetation for flood control purposes, resulting in an absence of willows and mule fat. This portion of Smuggler Gulch has been channelized and is about 20 feet wide and 10 feet deep. The SBLO crosses under the channelized section that is maintained by the City for flood control purposes.

Agricultural lands lie on both sides of this portion of Smuggler Gulch, and the lands adjacent to the channelized portion of Smuggler Gulch continue to be used for agricultural purposes. ~~Portions of the entire floodplain in the valley have been disturbed from agricultural practices.~~ Areas in the floodplain left fallow would eventually revert to the preexisting riparian community that vegetated the area before the disturbance. Evidence of the recovery of the vegetation community is present in portions of the river. Individual mule fat and young willow plants and riparian herbaceous species are colonizing areas of the floodplain that are not currently cultivated.

Disturbed Habitat. Disturbed habitat occurs along the west side of Spooner's Mesa along the base of the slopes. This classification refers to those areas that have had the native vegetation removed permanently due to urbanization. In this discussion, the disturbed designation refers to areas that are developed either as residential, commercial, or industrial areas, and it includes all associated paved roads, and graded or cleared areas (e.g., mining) that have been compacted so that no vegetation cover can develop.

Wildlife

Common species observed in coastal sage scrub include cottontail, black-tailed hare, woodrat, Botta's pocket gopher, coyote, gray fox, California ground squirrel, mule deer, wrentit, Anna's hummingbird, white-crowned sparrow, rock dove, house finch, scrub jay, yellow-rumped warbler, Bewick's wren, California quail, California towhee, bushtit, red-tailed hawk, Cassin's kingbird, and side-blotched lizard (RECON, 1994).

Dominant wildlife species in the grassland community included Botta's pocket gopher, mule deer, gray fox, coyote, California ground squirrel, striped skunk, western meadowlark, white-crowned sparrow, common raven, mourning dove, savannah sparrow, song sparrow, American kestrel, red-tailed hawk, house finch, and Pacific rattlesnake (RECON, 1994).

Special-Status Species

Special-status species potentially occurring on Spooner's Mesa are listed in Table 2.2-1, including those species listed as federal or state endangered, threatened, or species of concern. Plant species reported in the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (1994) are also included in this analysis.

Special-status species surveys were conducted on and around Spooner's Mesa for rare plants, California gnatcatcher, and Pacific pocket mouse (Pavelka, 1997; TW Biological Services, 1997).

One hundred and thirty-nine plant species were recorded during the rare plant surveys. Of those, 11 are considered special-status species: ashy spike-moss, Palmer's sagewort, sea dahlia, sand aster, San Diego sunflower, golden-spined cereus, coast barrel cactus, snake cholla, cliff spurge, wart-stemmed ceanothus, and Orcutt's bird's-beak (Pavelka, 1997).

California gnatcatchers were observed within the project area. One female and one pair were observed along the west slopes of Spooner's Mesa (TW Biological Services, 1997). No Pacific pocket mice were caught during the trapping effort (200 traps set over 10 nights) conducted in 1997 (Pavelka, 1997).

2.2.2 Marine Biological Resources

The information provided in this section is derived primarily from the Interim Operation SEIS (RECON, 1996) and the Marine Environmental Impacts of the Proposed Secondary Treatment System Report (Kinnetic Laboratories, Inc., 1991). Information was also drawn from the Marine Biological Resources Technical Report for the South Bay Ocean Outfall prepared by MBC Applied Environmental Sciences (1995) and from the City of San Diego 1995-1996 Baseline Data (1996). These reports are incorporated by reference.

2.2.2.1 Local Area Fisheries

Fifty-one species of fish have been observed at depths of 30 to 120 ft (9 to 37 m) in surveys of the Imperial Beach kelp bed, in offshore soft bottom areas (Southern California Coastal Water Research Project [SCCWRP], unpublished data; City of San Diego 1995), and in a description of San Diego recreational fishing areas (Squire and Smith, 1977). Twenty-eight of the species are found primarily on soft bottoms, 16 on hard bottoms and in kelp beds, and 7 are pelagic. Fish species in the near shore and offshore areas in the vicinity of Imperial Beach and Tijuana are listed in Table 2.2-2.

Pelagic species feed primarily on zoo-plankton and other fish. Yellowtail, white seabass, Pacific barracuda, and Pacific bonito are important predatory pelagic species caught by recreational fishermen. Other small, pelagic species that occur in the area, occasionally in abundance but possibly not captured in trawl surveys, include northern anchovy, Pacific mackerel, Pacific sardine, Pacific saury, and Pacific hake (Kinnetic Laboratories, Inc., 1991). The smaller of these species, including anchovies and smelt, are prey for seabirds when they school near shore and into bays and estuaries. Migratory pelagic species such as Pacific mackerel are known to occasionally congregate above wastewater outfalls (Smith, 1974; SCCWRP, 1973; County Sanitation District of Orange County, 1986).

Table 2.2-1
SPECIAL-STATUS PLANT AND WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF THE PROJECT SITE

Common Name	Scientific Name	Federal Status	State Status
Plants			
Salt marsh bird's beak	*Cordylanthus maritimus* ssp. *Maritimus*	FE	CE
San Diego barrel cactus	*Ferocactus viridescens*	FSC	CNPS 2
San Diego marsh-elder	*Iva hayesiana*	FSC	CNPS 2
Ashy spike-moss	*Selaginella cinerascens*		CNPS 4
San Diego sunflower	*Viguiera laciniata*		
Golden-spined cereus	*Bergerocactus emoryi*		CNPS 2
Snake cholla	*Opuntia parryi* ssp. *serpentina*	FSC	CNPS 1B
Coast barrel cactus	*Ferocactus viredescens*	FSC	CNPS 2
Wart-stemmed ceanothus	*Ceanothus verrucosus*	FSC	
San Diego sagewort	*Artemisia palmeri*		CNPS-2
Sea dahlia	*Coreopsis maritima*		
Sand aster	*Lessingia filaginifolia* var. *filaginifolia*		
Cliff spurge	*Euphorbia misera*		
Orcutt's bird's beak	*Cordylanthus orcuttianus*	FSC	CNPS 2
Reptiles			
Orange-throated whiptail	*Cnemidophorus hyperythrus beldingi*	FSC	CSC
Birds			
California Least Tern	*Sterna antillarum browni*	FE	CE
Caspian Tern	*Sterna caspia*		CSC
California Brown Pelican	*Pelecanus occidentalis*	FT	CE
Light-footed Clapper Rail	*Rallus longirostris levipes*	FE	CE
Western Snowy Plover	*Charadrius alexandrinus nivosus*	FT	CSC
Black-shouldered Kite	*Elanus caeruleus*		CFP
American Peregrine Falcon	*Falco peregrinus anatum*	FE	
Prairie Falcon	*Falco mexicanus*		CSC
Northern Harrier	*Circus cyaneus*		CSC
Sharp-shinned Hawk	*Accipiter striatus*		CSC
Cooper's Hawk	*Buteo cooperii*		CSC

Table 2.2-1
SPECIAL-STATUS PLANT AND WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF THE PROJECT SITE

Common Name	Scientific Name	Federal Status	State Status
Red-shouldered Hawk	*Buteo lineatus*		
Coastal California Gnatcatcher	*Polioptila californica californica*	FT	CSC
Yellow Warbler	*Dendroica petechia*		CSC
Least Bell's Vireo	*Vireo bellii pusillus*	FE	CE
Coastal Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE	CE
Mammals			
Pacific pocket mouse	*Perognathus longimembris pacificus*	FE	CSC
San Diego pocket mouse	*Chaetodipus fallax fallax*	FSC	CSC
San Diego woodrat	*Neotoma lepida intermedia*		CSC
California pocket mouse	*Chaetodipus californicus*	FSC	CSC

Source: EPA, 1994, 1996; RareFind, 1997; CNPS, 1994

Federal Status Codes:
FE Federal~~ly~~-listed, endangered
FT Federal~~y~~-listed, threatened
PE Federal~~y~~-proposed, endangered
PT Federal~~y~~-proposed, threatened
FSC These species were formerly known as "Category 2 Candidates." The USFWS does not have enough scientific information to support a listing proposal for these species. As of February 28, 1996, the USFWS no longer maintains a list of species of "Category 2 Candidates." The Service is still concerned about these species and continues to gather information about them.

State Status Codes:
CE State-listed, endangered
CT State-listed, threatened
CFP State fully protected species
CSC State species of special concern
CNPS Status Codes:
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3 Plants About Which We Need More Information- A Review List
4 Plants of Limited Distribution- A Watch List

Fish species associated with sand bottom and reef habitats are more localized in their movements than pelagic species. Fish that occupy kelp beds and reefs are dominated by perches, basses, rockfishes, wrasses, and gobies. In diver surveys in 1986 and 1987, 27 species of fish were observed in the Imperial Beach kelp bed, of which the most common species were senorita, halfmoon, and rainbow seaperch (Engineering Science, 1988). Some of the species encountered are pelagic species not usually associated with kelp beds.

Shallow rocky reefs lacking kelp typically have a lower abundance and diversity of fish species (Larson and De Martini, 1984). Remote video surveys in the cobble and rocky areas near the future outfall found California scorpionfish to be the dominant species (Kinnetic Laboratories, Inc., 1990). At depths below 100 feet (31 m), the shallow water reef and kelp assemblage is replaced by a greater diversity of rockfish species.

Kelp beds are important sportfish areas. Kelp bass and California sheephead are the most important kelp bed and hard-bottom species in the area for recreational fishermen (Squire and Smith, 1977). North (1971) estimated that 90 percent of the Southern California sportfishing party boat catch comprised of kelp bass and sand bass and 70 percent of the entire party boat catch came from kelp beds. In addition to fish, recreationally important invertebrates found in the Imperial Beach kelp bed include red abalone, California spiny lobster, and sheep crab (Engineering Science, 1988).

Table 2.2-2
FISH SPECIES OBSERVED IN NEARSHORE AND OFFSHORE AREAS OF IMPERIAL BEACH AND THE TIJUANA RIVER

Common Name	Scientific Name
Pelagic	
Topsmelt	*Atherinops affinis*
Jacksmelt	*Atherinopsis californiensis*
Yellowtail	*Seriola lalandi*
Jack mackerel	*Trachurus symmetricus*
White seabass	*Atractoscion nobilis*
Pacific barracuda	*Sphyraena argentea*
Pacific bonito	*Sarda chiliensis*
Kelp Beds and Hard Bottoms	
Leopard shark	*Triakis semifasciatus*
Coralline sculpine	*Arteduis corallinus*
Kelp bass	*Paralabrax clathratus*
Opaleye	*Girella nigricans*
Halfmoon	*Medialuna californiensis*
Kelp perch	*Brachyistius frenatus*
Black perch	*Embiotoca jacksoni*
Rainbow seaperch	*Hyspurus caryi*
Rubberlip seaperch	*Rhacochilus toxotes*
Pile perch	*Rhacochilus vacca*
Rock wrasse	*Halichoeres semicinctus*
Senorita	*Oxyjulis californica*
California sheephead	*Semicossyphus pulcher*
Stripefin ronquil	*Rathbunella hypoplecta*
Giant kelpfish	*Heterostichus rostratus*
Blackeye goby	*Coryphopterus nicholsii*
Shallow (10-40m) Soft Bottom	
Thornback	*Platyrhinoidis triseriata*
Shovelnose guitarfish	*Rhinobatos productus*
Round stingray	*Urolophus halleri*
Barred sand bass	*Scopraena guttata*
California scorpionfish	*Paralabrax nebulifer*
California halibut	*Paralichthys californicus*
C-O sole	*Pleuronichthys coenosus*

Table 2.2-2
FISH SPECIES OBSERVED IN NEARSHORE AND OFFSHORE AREAS OF IMPERIAL BEACH AND THE TIJUANA RIVER

Common Name	Scientific Name
Spreckeled sanddab	*Citharichthys stigmaeus*
Fantail sole	*Xystreurys liolepis*
California lizardfish	*Synodus lucioceps*
Plainfish midshipman	*Porichthys notatus*
Gulf sanddab	*Citharichthys fragilis*
Roughbacked sculpin	*Chitonotus pugetensis*
Deep (60m) Soft Bottom	
Pacific argentine	*Argentina sialis*
Calico rockfish	*Sebastes dallii*
Shortspine combfish	*Zaniolepis frenata*
Longspine combfish	*Zaniolepis latipinnis*
Yellowchin sculpin	*Icelinus quadriseriatus*
Pink seaperch	*Zalembius rosaceus*
Pacific sanddab	*Citharichthys sordidus*
Longfin sanddab	*Citharichthys xanthostigma*
Bigmouth sole	*Hippoglossina stomata*
English sole	*Pleuronectes vetulus*
Hornyhead turbot	*Pleurocichthys verticalis*
California tonguefish	*Symphurus atricauda*
Stripetail rockfish	*Sebastes saxicola*
Bay goby	*Lepidogobius lepidus*
Dover sole	*Microstomus pacificus*

Source: RECON, 1994, 1996

Within the kelp bed, bottom-dwelling species browse or forage for mobile prey, while species of the kelp canopy also feed on open-water plankton (Choat, 1982). Many of these demersal species feed at the ocean bottom, and, in areas of wastewater discharge, they may be exposed to particulates settling to the bottom. Consequently, demersal fish have been a concern of wastewater monitoring programs in Southern California.

Soft-bottom demersal fish are typically more associated with the benthic boundary than are kelp bed and reef fish. Common shallow-water species trawled from the depth of the future outfall include speckled sanddab, longfin sanddab, English sole, hornyhead turbot, yellowchin sculpin, and California lizardfish (City of San Diego, 1995). Barred sand bass and California halibut are also encountered at shallow depths and are important to recreational fishermen (Squire and Smith, 1977). Most halibut are fished along the sandy beaches north of the Tijuana River mouth, while barred sand bass are taken more offshore between depths of 75 and 120 feet (22.9 and 36.6 m).

In deeper waters (greater than 120 feet [36.6m]), the most abundant demersal fish are Pacific sand-dab, English sole, and pink seaperch (SCCWRP, 1995).

2.2.2.2 Pinnepeds and Cetacea

The South Bay (Southern California bight) contains the largest and most diverse populations of marine mammals in temperate waters of the world, with as many as 31 species (Norris et al., 1975). Most are seasonal migrants and are widely distributed throughout the bight. The most abundant species are the California gray whale, Risso's dolphin, common dolphin, and California sea lion (Schulberg et al., 1989). All marine mammals are protected against harassment, injury, or taking by the Marine Mammal Protection Act of 1973.

Twenty-four species of cetaceans (whales, dolphins, and porpoises) are found in the Southern California bight, six of which are listed as endangered (the gray whale was recently removed from the endangered list). Only the gray whale and the bottlenose dolphin occur frequently near shore in the vicinity of South Bay. All species are either transient or migratory in the area. The whales do not breed in Southern California. Most cetaceans feed on fish and squid, although bottlenose dolphins also take crabs and mollusks (gray whales also feed on bottom invertebrates, but only in their summer grounds in the Bering Sea) (Dohl et al., 1981).

Six species of pinnipeds (seals and sea lions) may be found in the Southern California bight (Bonnel, 1985). Pinnipeds reproduce on land and also "haul out" on beaches and rocky outcrops to rest for various periods of time. The nearest hauling grounds for pinnipeds are the Los Coronados Islands, approximately 7.5 miles (12 km) south of the international border in Mexico. These islands are considered minor hauling grounds for California sea lions, harbor seals, and northern elephant seals. They prey principally on schooling fish and squid. California sea lion is the most abundant species, accounting for 50 to 90 percent of all pinnipeds (Bonnel et al., 1981). Sea lions are most abundant during summer and autumn, while elephant seals and harbor seals are most abundant in winter and spring. The San Diego basin is used as a foraging area by a few animals associated with the Los Coronados Islands rookery. It may also be part of a migratory route used by animals from Mexican colonies moving to and from the islands in the Southern California bight (Bonnel et al., 1981).

2.2.2.3 Marine Birds

Approximately 80 species of seabirds (excluding shorebirds) occur in the Southern California bight, of which only 30 are relatively numerous (Bender et al., 1974; Briggs et al., 1981). Nearly half of the species are winter visitors (October through April). These include loons, grebes, sea ducks, gulls, terns, jaegers, and alcids (murres, auklets, and puffins). A few species are transients, and a small number of strays are recorded each year. Subtropical species in particular may arrive in late summer and autumn.

There are six species of summer visitors: sooty shearwaters, three species that nest to the south in Baja California, and two species that nest in the southern hemisphere and spend their winter in Southern California. Year-round avian visitors do not breed in Southern California but can occur somewhere in the bight at any time of year. Three species, California least tern, caspian tern, and elegant tern, nest on southern California mainland beaches and in estuaries. Eleven species regularly nest on the Channel Islands, seven of which are year-round residents of the bight. Seabird abundance differs with habitat: 50 to

95 percent of birds are associated with open water, 5 to 10 percent with mainland beaches, and 1 to 4 percent with island beaches.

Three seabird nesting colonies occur in or near the South Bay area (nesting sites in Baja California were not included) (Sowls et al., 1980). Three sites for California least tern, a federal- and California-listed endangered species, occur in Mission Bay, north San Diego Bay, and near the Tijuana River mouth. Western gulls also nest in San Diego Bay.

Shorebirds use the shores and waters of the South Bay area. Two protected habitats, the south San Diego Bay and the Tijuana estuary, are immediately adjacent to the South Bay. Shorebirds feed on a variety of prey, including mollusks (clams, snails), worms, crustaceans (crabs, amphipods, isopods), insects (adults and larvae), and other invertebrates. They feed by capturing visible prey, probing in the sand for buried organisms, or prying open sessile organisms on rocks.

The majority of coastal shorebirds are migratory and are typically absent in summer. ~~However, a~~A few, however—such as western snowy plover (federally listed as Threatened), long-billed curlew (California Species of Concern), black oystercatcher, whimbrel, and marbled godwit—are present year-round and may breed locally. The most abundant species include western sandpiper, least sandpiper, dowitchers, willet, marbled godwit, American avocet, sanderling, and semipalmated plover (Warnock et al., 1989). Seabirds, such as gulls, terns, and pelicans, may use the same habitats as shorebirds for resting and nesting.

2.2.2.4 Kelp Bed Data (Imperial Beach)

Small kelp beds occur within the South Bay area and are generally restricted to areas of subtidal rocks, boulders, and cobble within the photic zone (generally depths of 20 to 60 feet [6 to 18 meters]). The forest and dense canopy formed on the water surface provide food and a complex habitat for a highly diverse community of fish, invertebrates, and other algae (RECON, 1996a,b).

Two small patches of kelp bed, referred to as the Imperial Beach bed, occur off the Imperial Beach pier and near the Tijuana Slough mouth, about 2.5 miles and 1.0 mile (4.1 km and 1.6 km) north, respectively, of the outfall pipeline corridor (RECON, 1996a,b). The Imperial Beach bed is attached to boulders and cobbles, as opposed to consolidated reef. Recent surveys have shown that the bed is maintaining a small canopy area of about 27 acres (11 ha) (MBC Applied Environmental Services, 1995). This bed has been harvested intermittently by Kelco, a San Diego kelp harvesting company, but has not been considered a significant resource (Kinnetic Laboratories, Inc., 1991).

2.2.3 Terrestrial Biological Resources—Mexico

Figure 2.2-2 illustrates the current status of the potentially affected, naturally occurring, vegetative environment proximate to the project site in Mexico. The SBIWTP and the Hofer site are located directly~~ue~~ north of an area of Tijuana without appreciable biological resources. The area is classified as developed and no additional information is provided to suggest that biological resources are present (San Diego State University, 1997). In contrast, the areas south and southeast of Spooner's Mesa have four classifications in terms of biological resources.

The majority of the area is classified as developed, but smaller areas are classified as coastal sage scrub, natural flood channel/streambed, and unclassified disturbed habitat. These areas are primarily associated with Smuggler Gulch, although some of the unclassified disturbed habitat is associated with the drainage that connects to Goat Canyon.

At the time of preparation of this~~the Draft~~ SEIS, no information was available pertaining to the existence of sensitive or endangered wildlife species or habitats within this area of Mexico. Due to its high degree of residential and commercial development, in contrast to that north of the border surrounding the project site, it is unlikely that the area of Tijuana proximate to and immediately south of the SBIWTP project sites provides habitat opportunities for biological resources.

~~Figure~~

~~**2.2-2 Biological Resources—Mexico**~~

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2.2.4 Marine Biological Resources—Mexico

Marine biological resources in Mexican waters south of the border and ocean outfall site are similar to and do not differ substantially from those previously discussed for U.S. Pacific waters. These resources include halibut, kelp, kelp beds, barracuda, white sea bass, yellowtail, sheephead, and barred sandbass (Engineering Science, 1992). Kelp beds are located along the same bathymetric contours as kelp beds north of the border. Kelp beds historically have been found by the Coronado Islands and near coastal areas referred to as Popotla, Tijuana, Bahia Descanso, Punta Mesquite, Rosarito Bay, Geronimo Island, the Sacramento reef, and Punta San Carlos. The current extent of the kelp beds could not be ascertained at the time of this study although recent aerial surveys indicated that little kelp is visible and many areas are characterized as having no kelp or scattered plants. The kelp population appears to vary substantially over time. An aerial survey on October 8, 1997 estimated 1,000 tons of visible kelp while an aerial survey on November 19, 1997 estimated 500 tons visible. The visible kelp in the second survey was not located in the same kelp beds as the kelp that was visible in October (Glantz, 1997). ~~However, t~~The approximate extent of the ~~nearest~~ kelp bed nearest to the outfall is shown in Figure 2.2 of Appendix C.

The nearest hauling grounds for pinnipeds are the Los Coronados Islands, approximately 7.5 miles (12 km) south of the international border in Mexico. These islands are considered minor hauling grounds for California sea lions, harbor seals, and northern elephant seals. The San Diego basin is used as a foraging area by a few animals associated with the Los Coronados Islands rookery

2.3 Cultural and Paleontological Resources

The following discussion summarizes the cultural and paleontological resources in the vicinity of the proposed project site. Cultural resources include both archaeological and historical properties. Paleontological resources include pre-historical properties and resources. The cultural resources evaluation for the SBIWTP, the Hofer site, and the Spooner's Mesa site is in Appendix F.

2.3.1 Cultural Resources

As a federal undertaking, this project is subject to Section 106 of the National Historic Preservation Act. To implement Section 106 requirements for the project, a Programmatic Agreement (PA) has been established that guides the cultural resource (archaeological, historical, and cultural properties) management for actions discussed in this SEIS. The PA was signed by the State Historic Preservation Officer, the USIBWC, the Advisory Council on Historic Preservation, the EPA, and the City of San Diego. The PA provides for inventories of archaeological and historic properties, eligibility evaluations (for the National Register of Historic Places), drafting of a background study to guide the eligibility

Figure

2.2-2 Biological Resources—Mexico

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evaluations, and management recommendations; it requires the preparation of a management plan for those resources that are determined eligible for the National Register. It also provides for Native American consultation and coordination, procedures following discovery of unidentified historic properties, and duration of recovered materials.

To date, historic property inventories and significance evaluations have been completed for the SBLO, the SBIWTP site, the SBOO, and all associated canyon collectors, conveyance, and pumping facilities (RECON, 1990, 1991; Mariah Associates, 1994a, b, c). The City of San Diego has completed inventories and significance evaluations for the proposed South Bay Water Reclamation Plant and Dairy Mart Road Bridge Replacement project (Mooney, 1996). In 1997, the U.S. Army Corps of Engineers completed a cultural resources review and evaluation for the Supplemental Environmental Impact Statement for the International Boundary and Water Commission South Bay International Wastewater Treatment Plant Long-term Treatment Options. The alternatives evaluated included activated sludge or ponds on the adjacent Hofer site, and development of treatment ponds, conveyance, and pumping facilities on Spooner's Mesa.

2.3.1.1 Hofer Property

Surveying and geotechnical monitoring were conducted on the Hofer property by Mariah Associates, Inc., in 1994. One prehistoric archeological site was identified in a backhoe trench near the northwest corner of the SBIWTP. The limited cultural materials that were recovered included a piece of thermally altered rock, a unidirectional core, and two metavolcanic flakes. The site's recorder stated that the existence of thermally altered rock was probably indicative of a buried hearth. The site was tested and found to lack intact cultural deposits and was in a redeposited, disturbed context. Mariah's test concluded that CA-SDI-13,486 was not eligible for the National Register.

2.3.1.2 Spooner's Mesa

A records and literature search conducted by the U.S. Army Corps of Engineer in 1991 indicated that all of Spooner's Mesa had been surveyed. Previous archeological surveys on Spooner's Mesa identified 10 prehistoric archeological sites. The listed sites are: CA-SDI -7456, 8595, 8596, 8598, 8599, 8601, 8603, 8609, 8773, and 11,100. A survey and significance evaluation for the Border Highlands Project by John R. Cook of ASM Affiliates, Inc. was conducted in 1989. It encompassed the proposed Spooner's Mesa project area.

The report for the Border Highlands Project evaluated all of the sites present on Spooner's Mesa. Cook's report summarized the lack of eligibility on all but one of the sites. Site CA-SDI-7456 is a small disturbed soil horizon of probable natural origin and, therefore, not under consideration. CA-SDI-8595, 8596, 8599, 8601, 8603, and 8609 are all listed as low-density lithic scatters, and CA-SDI-8598 is an isolated artifact. Historic site CA-SDI-8773, a reported adobe, could not be relocated and is therefore nonsignificant. Archeological site CA-SDI-1,100 produced material from the surface and 17 flakes from the upper 2 inches (5 cm) of a 0.3-square-foot (0.03 m^2) test unit. Additional units were excavated at this site and were found to be negative.

The proposed outfall discharge line from Spooner's Mesa will not impact any cultural resources. The area was surveyed earlier for cultural resources and the only site that was reported in the area was the ethnographic village of Millejo. Construction monitoring of the

SBLO pipeline by the U.S. Army Corps of Engineers located minimal but possible evidence of the village (see Appendix F)~~.~~.

2.3.2 Paleontology

A paleontological reconnaissance for the City of San Diego's proposed South Bay Secondary Treatment Plant was conducted in 1990 (RMW, 1990). This reconnaissance included the SBIWTP site and the proposed South Bay Water Reclamation Plant adjacent to the SBIWTP. These two reconnaissance trips included literature reviews, review of records held at the San Diego Museum of Natural History, and field checks of the SBIWTP and reclamation plant sites, and the bluffs of Spooner's Mesa.

The Tijuana River valley~~Tijuana River Valley~~ was cut from uplifted marine sandstone deposits, and layers of marine and river alluvium were repeatedly deposited over the last 1.5 million years. The surface sediments are a mixture of recent river alluvium, colluvium, landslide debris, estuarine deposits, and beach sands that overlie older Late Pliocene and Pleistocene deposits of marine and alluvial sandstones and conglomerates.

2.3.2.1 San Diego Formation

The oldest sedimentary rocks expected to be found on the SBIWTP are the late Pliocene (2 to 3 million years old) sediments of the San Diego Formation, which are exposed in the southwestern portion of the site next to the international border. The San Diego Formation comprises sandstone and conglomerates that have marine and non-marine origin and produce large numbers and varieties of invertebrate and marine vertebrate fossils throughout the greater San Diego area. The marine sandstone could contain fossilized pelecypods, brachiopods, gastropods, echinoids, barnacles, sea birds, shark and ray teeth, bony fishes, walrus, fur seal, sea cow, dolphin, and whales. A large fossilized whale bone was reported to have been embedded in sands within the Nelson Sloan quarry area. Terrestrial fossils of wood and leaves, ground sloths, cats, wolves, skunks, peccaries, antelopes, deer, horses, and elephants have also been collected from this formation.

The San Diego Formation is considered a unit of high paleontological sensitivity due to its highly various fossil yield. There are, however, no reports of fossils from this formation in the project area.

2.3.2.2 Lindavista Formation

The Lindavista Formation is a shallow, early Pleistocene (approximately two million years old) marine sandstone deposit that is exposed on Spooner's Mesa south of Monument Road. It has yielded invertebrate, and occasionally vertebrate, fossils along I-15 in the South Bay and in the College area. The Lindavista Formation is considered to have a low potential of being fossiliferous because of the sporadic nature of the fossil findings associated with this unit. There are no reported fossils in the onsite exposures of this unit.

2.3.2.3 Bay Point Formation

The Bay Point Formation is the result of marine incursions during the Late Pleistocene (1.8 million to less than 150,000 years ago) associated with periods of glaciation and sea level changes. Bay Point Formation has yielded fossils of land animals and marine invertebrates in the Greater San Diego area, including fossilized corals radiometrically dated at 10,000 to 120,000 years ago. The Bay Point Formation underlies most of the SBIWTP and is considered moderately fossiliferous because of the sporadic nature of the fossil findings associated with this unit. No fossils have been reported from this formation onsite.

2.3.2.4 Quartenary Alluvium

Quartenary alluvium includes alluvium/slope wash from the bed of the Tijuana River valley~~Tijuana River Valley~~. The overall paleontological sensitivity of the project area is considered low because the geologic youth of alluvium generally precludes the existence of paleontological resources within these deposits. Although the fossilized remains of elephants were collected from alluvial deposits in the Tijuana River and near the Imperial Beach Naval Outlying Landing Field, fossil yields from alluvium have been of a very sporadic nature.

2.3.3 Cultural and Paleontological Resources—Mexico

Construction and implementation of the proposed project alternatives are not anticipated to affect cultural or paleontological resources of the Tijuana Municipality or environs in the vicinity of the SBIWTP, Hofer site, or Spooner's Mesa site because all construction would occur in the U.S. at least 300 feet from the U.S.-Mexico border. It is possible that cultural and paleontological resources could be affected at a sludge disposal site. ~~However,~~ T~~t~~he Mexican government, however, has not yet selected a disposal site. Therefore, the specific nature and attributes of the current Tijuana/Mexican cultural or paleontological environment are not yet known.

2.4 Land Use

This section discusses the land uses within and surrounding the proposed project sites. This information is based on the 1994 Final EIS (RECON, 1994).

2.4.1 Existing Conditions in the Tijuana River Valley

The Tijuana River valley~~Tijuana River Valley~~ is characterized by rural, sparsely populated land with current land uses primarily limited to agriculture and sand and gravel extraction. Agricultural uses in the river valley include fields for row crops, sod farms, horse breeding ranches, and stables. Home sites are scattered sparsely throughout the valley. Near the western end of the Tijuana River valley~~Tijuana River Valley~~ is the Tijuana River National Estuarine Research Reserve, a salt-marsh estuary located south of the Imperial Beach Naval Air Station. South of the reserve is Border Field State Park, an area of natural wetland habitat, separated from the ocean by a wide sand beach. The County of San Diego is acquiring land for the Tijuana Valley Regional Park.

Immediately adjacent to the southern edge of the valley lies the municipality of Tijuana, Baja California, Mexico. The City of Imperial Beach and the unincorporated community of Nestor are located approximately 2.2 miles (3.5 km) north of the international border. Along the eastern/northeastern edge of the valley lies the San Diego community of San Ysidro.

The SBIWTP is located along the U.S.-~~/~~Mexico border near the entrance of the Tijuana River into the United States. It is bounded on the east and north by the river floodplain, on the south by the municipality of Tijuana, and on the west by the Hofer property. West of the Hofer property is the site of the City of San Diego's proposed South Bay Water Reclamation Plant and a currently inactive sand and gravel quarry in the Border Highlands area. Spooner's Mesa is located along the Border Highlands west of the quarry and Smuggler Gulch (see Figure 1.3-2). The planning area designations in the vicinity of the SBIWTP are shown in Figure 2.4-1.

2.4.2 Planned Land Uses in the Tijuana River Valley

2.4.2.1 City of San Diego

The Tijuana River valley~~Tijuana River Valley~~ is within the Coastal Zone. The Coastal Zone Management Program for the area is governed by the California Coastal Act Policies and Plan, Local Coastal Program, and Tijuana River National Estuarine Sanctuary Management Plan. The California Coastal Plan (State of California, 1975) identifies the coastal area of the Tijuana River valley~~Tijuana River Valley~~ as Subregion 12 of the San Diego Coast Region. This plan describes this area as follows:

- Tijuana Estuary and River Valley
  - Preserve and protect resource and habitat values and agricultural lands
  - Prevent urban encroachment
  - Complete the acquisition of land and improve in a manner consistent with estuarine preservation
  - Retain and restore the estuary to tidal action

The Tijuana River Valley Plan and Local Coastal Program Addendum (City of San Diego, 1977) addresses the major portion of the Tijuana River valley~~Tijuana River Valley~~ and provides land use policies and goals for portions of the area within the City of San Diego and coastal zone. The overall goals of the plan are to provide flood protection, protect and preserve diminishing natural coastal areas, conserve and enhance agricultural productivity, and provide visual and passive relief from continuous urbanization. The specific objectives of the agricultural element are to restore the rich floodplain to more productive agricultural use, preserve open space, and conserve valuable natural deposits of alluvium and river bed sand. The part of the Tijuana River floodplain that lies between the levee paralleling I-5 and Saturn Boulevard is designated in the plan as an agricultural preserve. Stated benefits from the preserve include food production for an increasing population, aesthetic satisfaction resulting from maintained open space, educational benefits of model farm operations, and experimental plant hybridization. In addition to model farms and experimental hybridization programs, horse farms, nurseries, and orchards are desirable uses in the agricultural preserve.

Figure

2.4-1 Planning Area Designations

(8-1/2 x 11)

Slipsheet

South of Monument Road, between Old Dairy Mart Road and Border Field State Park, is an upland formation containing sand and gravel resources that is known as the Border Highlands area. An addendum to the Tijuana River Valley Land Use Plan and Local Coastal Program was adopted in 1982. The addendum addresses the phased extraction of mineral resources for this area and reclamation of mined areas for future open space and commercial recreation uses.

2.4.2.2 Multi-Species Conservation Plan

The City of San Diego and other regional jurisdictions, in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game, have prepared an overall Multi-Species Conservation Plan (MSCP) (City of San Diego, 1996) to implement the requirements of the California Natural Communities Conservation Planning Act of 1992 and Section 10a of the Endangered Species Act. The MSCP includes locally specific Subarea Plans for each covered jurisdiction. The Subarea Plan for the City of San Diego identifies the Tijuana River valley~~Tijuana River Valley~~ and estuary as a preserve area and gives the following specific guidelines for the Spooner's Mesa area:

- Maintain existing reserve (estuary) and park uses. Maintain a buffer around all wetland areas
- Maintain existing agricultural uses on Spooner's Mesa, with a long-term goal of phased restoration to coastal sage scrub, maritime succulent scrub, or native grassland
- Retain and enhance, where possible, existing riparian habitat along the Tijuana River

2.4.2.3 County of San Diego

The San Diego County Department of Parks and Recreation is currently acquiring property in the Tijuana River valley~~Tijuana River Valley~~ for inclusion in the planned Tijuana Valley Regional Park. The focused planning area for the park was adopted by the County Board of Supervisors and encompasses the area west of I-5, east of the Border Field State Park and Tijuana River National Estuarine Research Reserve, south of Imperial Beach. To avoid possible land speculation, a specific park boundary has not yet been determined. Ultimately, the park will comprise 1,100 acres (446 ha) centered along the Tijuana River. It is being paid for in part with $9.8 million from a state bond act approved by voters in 1988 for parks and wildlife preservation. The County will begin preparing a Master Plan for the park in 1997.

The primary goal of the Tijuana Valley Regional Park is agricultural and wildlife preservation; its location would provide protection for that portion of the river system which lies within the jurisdiction of the United States. Lands that are considered high priority for acquisition are those that presently provide viable habitat for sensitive bird species, agricultural land where sensitive bird species are also associated, and biologically marginal land for the more active uses of the park.

The County has recently acquired a portion of Spooner's Mesa on the northern slope with State Bond Act funds for the Tijuana River Valley Regional Park and has an option to acquire the remaining portions of the mesa. Conversion of park lands acquired through state bond funds for uses other than for park purposes would require significant and extensive procedures, including legislative action (San Diego County Department of Parks and Recreation, September 1997) (see Appendix A3).

2.4.2.4 Tijuana River National Estuarine Research Reserve

In 1982, the Tijuana River National Estuarine Research Reserve was established by NOAA to protect one of the few remaining large areas of coastal wetland in Southern California. Since 1982, a land acquisition program has been under way for the estuary. The Tijuana River National Estuarine Sanctuary Management Plan (1985) encompasses 2,531 acres (1,025 ha) in the western portion of the river valley and shoreline including the Border Field State Park area. The Management Plan addresses land use concepts, maintenance of environmental quality, natural and cultural resources protection and enhancement, public recreation, research, and sanctuary area management. The Management Plan is currently being updated.

2.4.3 Existing Land Uses

2.4.3.1 Residential Uses

The Tijuana River valley~~Tijuana River Valley~~ is characterized by rural, sparsely scattered dwellings including single-family homes and private ranches. According to the U.S. Census Bureau, 52 percent of the area's residents are Caucasian and roughly 36 percent are of Hispanic origin. The San Diego Association of Governments (SANDAG) has estimated the 1990 population within the Tijuana River Valley Community Planning Area at 165. Population growth is expected to be minimal and reach 170 by 2015. An estimated 51 housing units (1990 base) are within the area. These residences have an average of 3.2 persons per household.

2.4.3.2 Agricultural Uses

The Tijuana River valley~~Tijuana River Valley~~ is characterized by agricultural development with a diverse array of agricultural operations represented. Row cropping, organic sprouts production, and horse breeding and boarding have been the primary agricultural uses in this area. Another land use in the Tijuana River valley~~Tijuana River Valley~~ is a sand and gravel extractive operation.

The Tijuana River Valley Plan calls for agricultural preservation and enhancement of agricultural values and productivity. Retention of agricultural values is also meant to stem urban encroachment in this region. The Plan's agricultural element calls for restoration of the rich floodplain to more productive agricultural use, to preserve open space, and to conserve valuable national deposits of alluvium and river bed sand. Part of the floodplain itself is designated an agricultural preserve.

Soil resources in the study area include Chino silt loam (saline), Visalia sandy loam, Tujunga sand, tidal flats in the valley, Carlsbad gravelly loamy sand, and Terrace escarpments on Spooner's Mesa. Land comprising Chino silt loam and Visalia sandy loam are considered prime agricultural land. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, and oilseed crops; and is also available for these uses (currently unused, or used for range or some other purpose that would not preclude its use as farmland). Tujunga sand is classified as a soil of statewide importance. Carlsbad gravelly loamy sand is rated locally as good for truck crops and fair for citrus crops. Tidal flats and terrace escarpments are not suitable for agriculture, but are suited for wildlife habitat.

2.4.3.3 Extractive Uses

The Tijuana River valley~~Tijuana River Valley~~ has had extensive sand and gravel extraction operations in the past. Sand mining had been ongoing in the river until flooding occurred in 1993. The area known as Border Highlands, south of Monument Road and east of Border Field State Park, has had past extraction operations and is designated under current land use plans as a reserve for sand and gravel resources and extraction activities. The deposits are designated as Mineral Resource Zone 2 (MRZ-2). MRZ-2 represents areas where adequate information indicates that significant mineral aggregate deposits are present, or where it is judged that a high likelihood for their presence exists. In compliance with the Surface Mining and Reclamation Act of 1975, the project site has also been mapped into mineral resource zones. The project area is mapped into ~~Zone~~ MRZ-2.

2.4.3.4 Recreational Uses

Recreational use and preservation of natural coastal resources account for the bulk of the Tijuana River valley~~Tijuana River Valley~~ acreage. Specific recreational areas include Border Field State Park, Tijuana River National Estuarine Sanctuary, Tijuana Slough National Wildlife Refuge, and all of the beach areas. Some smaller recreational areas include the Chula Vista Model Airplane and Radio Control Club and the YMCA Camp Surf in Imperial Beach.

Border Field State Park is part of the Estuarine Reserve and is located at the westernmost end of the Tijuana River valley~~Tijuana River Valley~~, at the southwest corner of the continental United States. This park is one of the few remaining U.S. beaches that allows horseback riding, which is a popular form of recreation in this park. Other activities include bicycling, hiking / walking, picnicking, and nature viewing. The park is open for day use only. Border Field State Park offers a unique view of the border and the Tijuana bullring, as well as views of the Los Coronados Islands and Playas de Tijuana. No camping is allowed in the park. Visitor attendance at Border Field State Park has grown from 78,000 in 1992 / 19~~/~~93 to 217,000 in the 1994 / 19~~/~~95 fiscal year. Although ~~While~~ it appears that attendance almost tripled during that period, 1992 to 1993 was a period of severe flooding, requiring a significant number of beach closures.

The Chula Vista Model Airplane and Radio Control Club has a relatively small site in the river valley used for flying model airplanes. The club recently moved from Border Field State Park to a site just west of the SBIWTP. According to a club member, the club has a total of 112 members. Actual activity levels could not be identified, but the site includes parking for 23 cars and is typically full on weekends.

The YMCA Camp Surf is located in North Imperial Beach, just south of Silver Strand State Beach. The camp operates all year and offers environmental education classes for school children during the spring and fall school seasons. The environmental classes use the beach, and during the summer months the camp offers additional recreational activities to all children. The activities include pier fishing, surfing, and arts and crafts. The YMCA camp, which remains relatively full when open, is dependent on the nearby ocean for most of its activities and business.

Numerous equestrian businesses exist in the valley, including horse rentals, boarding, or breeding. The rental businesses operate all year and use the nearby trails and beaches. SANDAG estimates that the total 1990 employment base in the Tijuana River Valley Community Planning Area was 189 and forecasted to reach 286 by 2015. According to a recent (1995) survey conducted by members of the Tijuana River Valley Equestrian Association and Mounted Assisted Unit and Citizens Against Recreational Eviction, the area has a total of 876 horses. The area has three rental stables with a total of roughly 150 rental horses. These rental horses represent an estimated 20,000 horse rides per year in the valley. The area also includes three thoroughbred breeding ranches and five full-time boarding stables. Horse riders have access to numerous trails and are allowed on the beaches in the valley vicinity. The valley has 27 miles (43.5 km) of trails as well as trail access to the Otay Mesa area. Based on the above-mentioned survey, total ridership in the valley and to Otay Mesa include roughly 100,000 trips per year.

2.4.3.5 Military Uses

Navy Outlying Field, Imperial Beach (NOLF-IB) is a U.S. Navy helicopter air station located on 1,378 acres (558 ha) in the northwest portion of the Tijuana River valley~~Tijuana River Valley~~, adjacent to Imperial Beach and the estuary. It supports helicopter training operations for squadrons based at Naval Air Station North Island in Coronado, with over 300,000 operations per year. The SBIWTP and Spooner's Mesa areas are south of the approach and departure operations corridors or accident potential zones.

2.4.3.6 Border Operations

The international border between the United States and Mexico is 300 feet (91 m) south of the SBIWTP. A steel border fence has been erected all along the southern boundary of the U.S. from the ocean to the International Crossing at San Ysidro and eastwards. (Refer to Figure ~~4-~~2.) On the U.S. side, west of the San Ysidro crossing, the area north of the fence is cleared of vegetation and night lighting stanchions are installed. The U.S. Border Patrol continuously monitors entry across the fenced areas and activity in the river valley by vehicle and aerial patrols. An additional two sections of fence are being constructed at the border. The fence will extend approximately 100 feet (30 m) north of the existing fence. The SBIWTP has a perimeter screen of narrowly spaced pillars to provide security and restrict access to the plant.

2.4.4 Land Use—Mexico

As noted previously, the SBIWTP is located along the U.S.-~~/~~Mexico border south and west of the crossing of the Tijuana River into the United States, bounded on the south by the municipality of Tijuana, Baja California, Mexico. In contrast to the rural, sparsely populated, and primarily agricultural land uses that surround the project site north of the border, land uses in Tijuana proximate to the project site are predominantly high-density residential and/or commercial, with isolated pockets of heavy industry (Figure 2.4-2).

In 1996, the municipality of Tijuana recorded a population of approximately 1,092,468 inhabitants, a total area of 306,046 acres (123,949 ha ~~[ha]~~), and an urban area of 71,365 acres

(28,903 ha). The following land use categories comprise the total area of the Tijuana Municipality:

Land Use	Percent
Residential	29.24
Commercial/Services	3.41
Industrial	2.86
Agroindustrial	1.75
Agricultural	0.09
Public Services Facilities	2.08
Green Belts	0.49
Surface Impoundments	0.84
Rivers	0.65
Reservoirs	0.02
Reserve	58.59

Public services facilities include education; cultural; hospitals / healthcare units; social services; sports and recreation; municipal markets; slaughter houses; communications; transportation; public administration; and public services such as fire departments, graveyards, and municipal landfills.

The urban area includes the following main categories:

Category	Acres	Hectares
Residential	28,249	11,441
Commercial/Services	3,002	1,216
Equipping	3,802	1,540
Industrial	3,647	1,477
Country Estates	1,741	705
Open Space Outside of the Existing Urban Area	21,052	8,526
Open Space Within the Existing Urban Area	10,030	4,012

The land requirements for urban growth are projected to be:

	Acres	Hectares	Year
Immediate Development	10,383	4,205	1994
Short-Term	3,420	1,385	1996
Median-Term	6,306	2,554	1999
Long-Term	30,526	12,363	2013
Total	50,635	**20,507**	**(2013)**

The residential area to the south of the SBIWTP is included in Planning Sector 3, which has a total land area of 5,839 acres (2,365 hectares). To the southwest of the SBIWTP along the border, Sector 1 includes the Playas de Tijuana residential area. The area of Sector 1 is approximately 1,304 acres (528 hectares). To the southeast of the SBIWTP, approximately

Insert Figure

2.4-2 Land Use—Mexico

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60 percent of Sector 5 includes a commercial/services area. The total Sector 5 area is 2,375 acres (962 hectares) (Urban Planning and Ecology Department of Tijuana Municipality, 1994).

Planning areas in the Tijuana Municipality are classified according to potential opportunities for development, based on physical conditions. The classification provides four different categories: suitable, nonsuitable, conditional, and special use. The areas to the south of the SBIWTP sites predominately fall in the suitable category, except areas that include canyons and ravines that slope toward the border, particularly in the vicinity of Spooner's Mesa.

2.5 Traffic and Transportation

This section discusses the traffic and transportation system within and surrounding the proposed project site.

2.5.1 Existing Facilities and Access

The Tijuana River valley~~Tijuana River Valley~~ is primarily used for agriculture, natural and recreational open space, and scattered rural residential use; it has limited surface transportation facilities. Access to the valley is from the Interstate 5/Dairy Mart Road interchange south along Dairy Mart Road, or from Imperial Beach along Hollister Street south to Monument Road. Monument Road extends from Dairy Mart Road west to Hollister street and to the entrance to Border Field State Park. The existing transportation routes in the vicinity of the SBIWTP are shown in Figure 2.5-1. Dairy Mart Road, Monument Road, and Hollister Street are all two-lane paved roads. (The Dairy Mart Road and Hollister Street crossings of the Tijuana River were washed out in 1993. A temporary bridge crossing of Hollister Street has been in use since that time.) Because of the residential and agricultural uses and ongoing border monitoring, there are also numerous ephemeral roads crossing the area.

Access to the SBIWTP and Hofer site is from Dairy Mart Road along an easterly extension of Monument Road, which is also a two-lane paved road. Access to Spooner's Mesa is from Monument Road along a steep, unpaved access road cut along the north face of the mesa.

Dairy Mart Road south of I-5 has a current average daily traffic (ADT) count of approximately 2,000 vehicles between I-5 south to Monument Road. Hollister Street south of Tocayo Boulevard also has an ADT count of 2,000 vehicles. Monument Road has an ADT count of 1,000 vehicles from Dairy Mart Road to Border Field State Park. I-5 has a current ADT count of 65,000 vehicles between Dairy Mart Road and SR-905. SR-905 west of I-5 (Tocayo Boulevard) has an ADT count of 10,000 vehicles to its intersection with Hollister Street (SANDAG, 1996). These ADT counts include construction traffic for the SBIWTP and SBOO.

There is no transit service within the Tijuana River valley~~Tijuana River Valley~~. The nearest bus service is available on Dairy Mart Road north of I-5 and at Tocayo Boulevard and Hollister Street. Light-rail transit service exists from San Diego to San Ysidro terminal adjacent to the border port of entrance.

Figure

2.5-1 Major Roads in the Project Area

(8-1 / 2 x 11)

Slipsheet

2.5.2 Planned Facilities and Access

Future traffic circulation patterns and volumes are not anticipated to change substantially. An approved, but not completed, single-family residential development, Coral Gate, has access from Dairy Mart Road along Camino de la Plaza, a currently unpaved road that will ultimately be improved to four lanes extending east from Dairy Mart Road just south of the I-5 interchange. Increased traffic from this development could increase the traffic flow along Dairy Mart Road north of Camino de la Plaza and at the I-5 interchange, but is not expected to adversely affect the access to or internal circulation within the Tijuana River valley~~Tijuana River Valley~~ (City of San Diego, 1991). The City of San Diego will construct a future wastewater reclamation plant just west of the SBIWTP and, as part of that project, the City will construct a 1,000-foot (300-m) bridge crossing the Tijuana River on Dairy Mart Road to reduce the potential for closure or erosion of the crossing during flood events. Improvements of the Monument Road crossing of Smuggler Gulch were made to allow all-weather access and compatibility with equestrian riders.

2.5.3 Traffic and Transportation—Mexico

In contrast to the limited surface transportation facilities that exist in the rural and primarily agricultural lands surrounding the project site, the street and highway network in Tijuana proximate to the project site typifies that of a high-density residential, commercial, and heavy industrial area. Figure 2.5-1 delineates the local Tijuana roadway and highway system within approximately 3 miles of the border.

The Summary Report for the urban development program for the Tijuana Municipality (Programa de Desarrollo Urbano del Centro de Población Tijuana—Versión Abreviada) (Urban Planning and Ecology Department of the Tijuana Municipality, 1994) provides a classification of roads, statistics of vehicular traffic, and public transportation. Tijuana roads are classified as follows:

- Regional roads (carretera regional) connects two or more communities and are subdivided into federal roads (no fee required) and toll roads.
- Roads with controlled access (via de acceso controlado) are inner loops and speed connector roads (viaductos and perifericos).
- Primary roads (vialidad primaria) are boulevards and main avenues (calzadas y avenidas principales) within the urban area.
- Secondary roads (vialidad secundaria) are avenues or streets connected to a primary road.
- Local streets (calle local) are streets connecting urban development (subdivisions) with a secondary road.
- Pedestrian corridors are streets or corridors restricted to pedestrian use.

Transportation infrastructure is classified in two categories: interstate and urban. Interstate transportation includes 425 buses, 1,104 cargo vehicles, and 61 tourist service vehicles. Urban transportation includes public transportation, which includes 164 taxi routes with approximately 5,227 units, 112 bus routes with 1,703 units, and 1,109 cargo vehicles.

The reported vehicular traffic pattern is identified as follows:

Type	Number of Units
Nonlocal	1,590
Local Load Transportation	1,109
Public	6,930
Private	210,294
Total	**219,923**

The statistical types of trips recorded for this report are summarized in Table 2.5-1.

Table 2.5-1
TRIP TYPES IN TIJUANA MUNICIPALITY

To	From	Number of Trips	Percent
Home	Work	144,630	37
Home	School	53,980	14
Home	Shopping	53,040	14
Home	Visit Friends	34,134	9
Home	Doctor	17,798	5
Home	Others	34,899	9
Not Including Home		49,749	13
	Total	**388,230**	**101**

An indication of the current level of traffic using the primary highway near the project site can be obtained from the number of vehicles (cars, trucks and buses) crossing the California-Baja California border at San Ysidro, as shown in Table 2.5-2.

Table 2.5-2
NUMBER OF VEHICLES CROSSING THE U.S.-MEXICO BORDER AT SAN YSIDRO

	1991	1992	1993	1994	1995
Trucks	24,138	88	0	0	0
Buses	60,349	14,787	29,733	68,502	74,435
Passenger Vehicles	13,715,288	13,540,135	14,667,073	15,933,956	13,833,715

Source: Sweedler and Ganster (1997)

Sludge trucks from the advanced primary operation of the SBIWTP exit the plant directly onto a westbound lane of a primary road, International Avenue. International Avenue has a relatively steep grade as it climbs from the SBIWTP to the Spooner's Mesa area. Currently, the sludge trucks pass through a major intersection, the intersection of International Avenue, Paseo Playas de Tijuana, and Libramiento Sur, the inner loop. The trucks transfer onto Paseo Playas de Tijuana, a regional road that turns into a federal toll road. The trucks exit at the San Antonio de los Buenos treatment plant.

2.6 Socioeconomics

This section addresses the population, income, and employment characteristics of the SBIWTP, the Hofer site, and the Spooner's Mesa site and surrounding vicinity, in comparison to the County of San Diego as a whole. This section also discusses the current population location, distribution, density, and growth rates.

2.6.1 San Diego County

2.6.1.1 Population

According to 1990 U.S. Census Bureau (1990) data, the County of San Diego reported a total population of 2,498,016 persons, the majority of whom (approximately 95 percent) live within or adjacent to urbanized areas. Population data for the County is provided in Table 2.6-1.

Table 2.6-1
SAN DIEGO COUNTY POPULATION DATA (1990)

	Persons
Urban	2,377,715
Rural	120,301
Total	**2,498,016**
Families	605,144
Households	887,719

Source: U.S. Census Bureau (1990)

2.6.1.2 Employment and Income

According to 1990 U.S. Census Bureau data, the County of San Diego reported workforce composition by industry, occupation, and worker class for employed persons 16 years and over, as shown in Table 2.6-2.

Table 2.6-2
SAN DIEGO COUNTY EMPLOYMENT DATA OF EMPLOYED PERSONS 16 YEARS AND OLDER (1990)

Industry		Occupation		Class of Worker	
Agriculture, Forestry, & Fisheries	26,884	Executive, Managerial, Administrative	167,190	Private Wage ~~&~~and Salary (Profit)	791,808
Mining	1020	Professional Specialty	177,531	Private Wage and Salary (Nonprofit)	60,922
Construction	88,955	Technical	50,797	Local Government	81,895
Manufacturing	157,717	Sales	148,420	State Government	38,631
Transportation	37,168	Administrative Support	181,782	Federal Government	67,519
Communications, Utilities	26,081	Service - Household	7,678	Self-employed	99,803

Table 2.6-2
SAN DIEGO COUNTY EMPLOYMENT DATA OF EMPLOYED PERSONS 16 YEARS AND OLDER (1990)

Industry		Occupation		Class of Worker	
Wholesale, Retail Trade	252,749	Service - Protective	19,489	Unpaid Family Workers	4,688
Finance, Insurance, ~~&~~ Real Estate	93,152	Service - Other	126,359		
Business and~~&~~ Repair Services	67,053	Farming, Forestry, Fishing	24,346		
Personal Services	48,015	Production, Repair	127,447		
Entertainment, Recreation	19,156	Machine Operators and Assemblers	45,131		
Professional Services	267,490	Transportation and Material Handling	31,411		
Public Administration	59,826	Laborers	37,685		

Source: U.S. Census Bureau (1990)

Median household income reported for 1989 was $35,022; median family income reported was $39,798; and per capita income was reported as $16,220. Approximately 8 percent of the total county households surveyed were reported to be on public assistance income. Poverty status data for the County of San Diego for 1989 is shown in Table 2.6-3.

Table 2.6-3
SAN DIEGO COUNTY POVERTY STATUS DATA FOR PERSONS FOR WHOM POVERTY STATUS IS DETERMINED (1989)

Persons Above Poverty Level		Persons Below Poverty Level	
White	1,650,592	White	151,787
Black	111,027	Black	29,972
American Indian, Eskimo, Aleut	16,527	American Indian, Eskimo, Aleut	3,473
Asian/Pacific Islander	168,722	Asian/Pacific Islander	25,482
Other	118,084	Other	60,676
Total	**2,064,952**	**Total**	**271,390**

Source: U.S. Census Bureau (1990)
Note: Race, as used by the Census Bureau, is not meant to denote any scientific or biological component of race. The subgroups displayed in this table represent the self-categorization of respondents (i.e., individuals identifying themselves as Hispanic could also be included under other ethnic classifications; therefore, the percentages could exceed 100 for a geographical area).

2.6.2 Local Area Setting

2.6.2.1 Population

The SBIWTP and environs are within an area encompassed by Census Tracts 100.09 and 101.09~~U.S. postal zip code 92154~~ in the southwestern part of the County of San Diego. This area is shown in Figure 2.6-1. This area comprises primarily a sparsely developed and populated rural highland area. According to 1990 U.S. Census Bureau data, the total population reported for

~~When the SBIWTP~~

Figure

2.6-1 Local Population Setting, Census Tracts 100.09 and 101.09~~Zip Code 92154~~

(8-1 / 2 x 11)

Slipsheet

Census Tracts 100.09 and 101.09~~zip code area 92154~~ consisted of 9,268~~59,805~~ persons, all of whom are considered to live inside an urbanized area. Population data for Census Tracts 100.09 and 101.09~~zip code area 92154~~ are provided in Table 2.6-4. ~~becomes fully operational, a new postal zip code number will be added. The new zip code for the SBIWTP will be published at that time.~~

Table 2.6-4
CENSUS TRACTS 100.09 AND 101.09~~U.S. POSTAL ZIP CODE 92154~~ POPULATION DATA (1990)

	Persons
Urban	9,268~~59,805~~
Rural	0
Total	**9,268~~59,805~~**
Families	2,154~~14,032~~
Households	2,352~~16,291~~

Source: U.S. Census Bureau (1990)

2.6.2.2 Employment and Income

According to 1990 U.S. Census Bureau data, the County of San Diego reported workforce composition by industry, occupation, and worker class for employed persons 16 years and over living within Census Tracts 100.09 and 101.09~~zip code 92154~~. These data are shown in Table 2.6-5.

Table 2.6-5
CENSUS TRACTS 100.09 AND 101.09 ~~U.S. POSTAL ZIP CODE 92154~~ EMPLOYMENT DATA FOR EMPLOYED PERSONS 16 YEARS AND OLDER (1990)

Industry		Occupation		Class of Worker	
Agriculture, Forestry, ~~y, &~~ Fisheries	67~~312~~	Executive, Managerial, Administrative	341~~2,279~~	Private Wage and Salary (Profit)	2180~~16,207~~
Mining	0~~22~~	Professional Specialty	119~~1,945~~	Private Wage and Salary (Nonprofit)	83~~1,114~~
Construction	215~~1,506~~	Technical	67~~899~~	Local Government	191~~1,557~~
Manufacturing	528~~3,869~~	Sales	380~~2,803~~	State Government	142~~754~~
Transportation	138~~1,166~~	Administrative Support	559~~4,744~~	Federal Government	283~~3,580~~
Communications, Utilities	66~~560~~	Service - Household	26~~149~~	Self-employed	212~~1,195~~
Wholesale, Retail Trade	778~~5,989~~	Service - Protective	112~~718~~	Unpaid Family Workers	0~~57~~
Finance, Insurance, and Real Estate	190~~1,209~~	Service - Other	490~~3,473~~		
Business and Repair Services	146~~1,494~~	Farming, Forestry, Fishing	67~~375~~		
Personal Services	180~~1,307~~	Production, Repair	392~~3,622~~		
Entertainment, Recreation	38~~318~~	Machine Operators and Assemblers	193~~1,673~~		

Table 2.6-5
CENSUS TRACTS 100.09 AND 101.09 ~~U.S. POSTAL ZIP CODE 92154~~ EMPLOYMENT DATA FOR EMPLOYED PERSONS 16 YEARS AND OLDER (1990)

Industry		Occupation		Class of Worker
Professional Services	493~~4,098~~	Transportation and Material Handling	96~~772~~	
Public Administration	252~~2,614~~	Laborers	249~~1,012~~	

Source: U.S. Census Bureau (1990)

Median household income (1989) reported for Census Tracts 100.09 and 101.09 ~~1989~~ was $14,066 and $39,583, respectively~~34,756~~; median family income reported for Census Tracts 100.09 and 101.09 was $13,619 and $39,057, respectively~~35,663~~; ~~and~~ per capita income for Census Tracts 100.09 and 101.09 was reported as $4,637 and $9,808, respectively~~10,183~~. For Census Tract 100.09, approximately ~~Approximately~~ 26~~13~~ percent of the total households surveyed reported no wage or salary income, while only 8.5 percent of households reported no wage or salary income for Census Tract 101.09. For Census Tract 100.09, approximately 44~~13~~ percent of the households surveyed also were reported to be on public assistance income, while only about 11 percent of households were reported to be on public assistance income for Census Tract 101.09.. Poverty status for 1989 for Census Tracts 100.09 and 101.09 ~~the 92154 zip code area~~ is shown in Table 2.6-6.

Table 2.6-6
CENSUS TRACTS 100.09 AND 101.09 ~~U.S. POSTAL ZIP CODE 92154~~ POVERTY STATUS DATA FOR PERSONS FOR WHOM POVERTY STATUS IS DETERMINED (1989)

Persons Above Poverty Level		Persons Below Poverty Level	
White	2361~~24,638~~	White	722~~2,280~~
Black	287~~2,437~~	Black	258~~548~~
American Indian, Eskimo, Aleut	21~~353~~	American Indian, Eskimo, Aleut	0~~18~~
Asian/Pacific Islander	1320~~12,234~~	Asian/Pacific Islander	101~~682~~
Other	2407~~12,134~~	Other	1733~~3,031~~
Total	**6396~~52,796~~**	**Total**	**2814~~6,559~~**

Source: U.S. Census Bureau (1990)

2.6.3 Previous Socioeconomic Studies

2.6.3.1 1994 Final Environmental Impact Statement

The 1994 Final EIS (RECON, 1994) reported that economic activities occurring within the project's potential sphere of influence include commercial fishing, kelp farming, and shipping activities.

2.6.3.1.1 Commercial Fishing

As noted in the 1994 Final EIS, San Diego's commercial fishing fleet includes about 500 licensed vessels and 1,500 licensed fishermen (Kaupp, 1986). Although tuna comprise about 45 percent of the commercial catch brought ashore at San Diego (4,041,000 pounds

[1,837 metric tons] valued at $5,027,000 for 1987), port landings have declined significantly during the last decade due to the transfer of canning operations overseas.

Commercial fishing generated more than $60 million in 1987 for the City's economy. Commercial fishery landings at the ports of Mission Bay and Oceanside are small compared to the Port of San Diego and have diminished over the last 3 years. Most of the nearshore fish and shellfish harvested by commercial fishermen are taken in the vicinity of kelp beds.

As with recreational fishing, commercial fishing in the South Bay and off Sorrento Valley is much less intensive than in the northern areas of San Diego County. The South Bay, however, does have an emerging prawn/shrimp fishery that is likely to outpace those of other areas in San Diego County. The only mariculture lease in the project area is a 10-acre (4 ha) site located 1 nautical mile (1.85 km) off the Silver Strand State Beach lookout tower, 5 nautical miles (9.25 km) from the proposed SBOO. This site has been used for marine bivalve aquaculture in the past, but the CDFG had to suspend the operation because of declining water quality due to intrusion of Mexican sewage flows.

2.6.3.1.2 Kelp Harvesting

As noted in the 1994 Final EIS, a San Diego-based company, Kelco, regularly harvests the *Macrocystis* sp. (giant kelp) canopy from Point Loma, La Jolla, and in the North County from Del Mar through Carlsbad. Kelp is gathered by a specially designed ship that cuts the kelp to a depth of about 3 feet (0.9 m) below the surface (McPeak and Glanz, 1984). The small kelp bed off the mouth of the Tijuana estuary has been harvested intermittently by Kelco in the past, but has not been a significant resource.

2.6.3.1.3 Shipping

San Diego Harbor is a major commercial shipping center for the southwest United States. Between 1,200 and 1,400 commercial and other vessels called at San Diego Bay annually during the period from 1979 to 1983 (EPA, 1988). The commercial shipping lanes, however, are over 5 miles offshore, and are well beyond the SBOO discharge area.

2.6.4 Socioeconomics~~—~~—Mexico

None of the alternatives will have facilities constructed or operated in Mexico. Mexico is currently in the process of identifying a sludge disposal facility and site but information on the facility is un~~not~~ available at the time of publication of this SEIS. Because all ~~of~~ the identified facilities are within the United States, construction and implementation of the alternatives~~proposed action~~ are not anticipated to affect the present or future socioeconomic characteristics of the Tijuana Municipality or environs. Therefore, the specific nature and attributes of the current Tijuana/Mexican socioeconomic environment have not been addressed or quantified further within this~~the present~~ SEIS.

2.7 Public Health and Safety

This section addresses those aspects of existing conditions at the project site that pertain to public health and safety, including the regulatory setting and hazardous materials.

2.7.1 Regulatory Setting

This section presents existing baseline environmental conditions in the context of federal and state laws governing hazardous materials and hazardous wastes, and addresses previous investigations of physical conditions undertaken on or near the project site to determine compliance with applicable laws and regulations for protection of public health and safety. These laws include:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- California Hazardous Substances Account Act

2.7.2 Previous Public Health and Safety Studies

2.7.2.1 Final Environmental Impact Statement

The 1994 Final EIS (RECON, 1994) discussion of hazardous materials and/or wastes related to the ~~project site~~ affected environment of the project site was limited to a discussion of the contaminated nature of the Tijuana River. The 1994 Final EIS noted that the Tijuana River is highly contaminated by continuing spills from the Tijuana sewer system and by drainage of sewage from large populated areas within the Tijuana Municipality that are not served by any sewer system. The 1994 Final EIS also noted that the river water was black, foul-smelling, and indistinguishable from raw sewage at Dairy Mart Road in 1991. Although this situation has since improved, continuing sewage flows during wet weather pose environmental and health concerns, including vector-borne disease, from potential exposure to hazardous wastes.

The EPA's Risk Management Program (RMP) under Title III (Section 112) of the 1990 Clean Air Act Amendments addresses air toxics and creates Section 112 (r). Facilities with processes that use or store specified flammable and toxic materials above certain threshold quantities (TQs) are subject to regulation under the new RMP. All affected facilities are required to submit an RMP to a publicly accessible central location by June 20, 1999. RMP requirements include the preparation of an executive summary, a registration form, results of an offsite consequence analysis (OCA), a 5-year accident history for all processes, release prevention program elements, emergency response program elements, and a certification statement. If the selected alternative uses and stores flammable or toxic compounds at TQ levels, then these RMP requirements will be required.

2.7.3 Project Site

Previous land uses have affected the localized environments but not to a level of concern, except at the Hofer site. An environmental site assessment was conducted at the Hofer site for that reason. At the SBIWTP, the impacts by past land uses were addressed prior to construction. Past land uses at the Spooner's Mesa site have not been cause for conducting an environmental site assessment.

2.7.3.1 Environmental Site Assessment—Hofer Property

The Hofer property historically was used for agriculture (farming and cattle ranching). Purchased by Mr. Hofer in 1957, it continued to be used as a dairy farm until 1982.

Portions of the property also have been leased for other activities, including game bird ranching, scrap metal salvage, auto repair, feed storage, and fertilizer processing.

In June 1997, an Environmental Site Assessment (ESA) was completed for the purpose of evaluating the potential for and extent of contamination associated with approximately 43 acres (17.4 ha) in two parcels, presently owned by two owners, Mr. Julius Hofer and the USIBWC, that are being considered for planned future expansion of the SBIWTP (Woodward-Clyde, 1997). (See Figure 2.7-1.) A soil sampling program was implemented based on results of previous investigations. Groundwater samples also were collected from five existing wells.

Figure

2.7-1 Hazardous Waste Sites Reported in the Project Vicinity

(8-1 / 2 x 11)

The Hofer property lies to the west of the SBIWTP. The property would have to be purchased if either of two alternatives under evaluation in this SEIS were selected; (1) the Activated Sludge with Expanded Capacity alternative (see Section 1.5.2.2) or the CMA at Hofer alternative (see Section 1.5.3.1). Former uses of the site, however, have contaminated the soil in some areas with lead, and in one area with polychlorinated biphenyls (PCBs). For this reason, a site assessment was directed by the lead agencies (Woodward-Clyde, 1997). The site assessment characterized the contamination with respect to its location, size, depth, and concentration. Using this assessment, a cost estimate was developed for remediating the site. In addition to lead and PCBs, a large amount of scrap metal and trash was identified onsite.

The 1994 Phase II study (Geofon, 1994) and 1997 ESA investigated various areas on the Hofer property. The results of these investigations are presented below.

- Burn Pit Area (Area 1)—Contaminants detected above background levels include cadmium, copper, lead, nickel, zinc, TPH, and PCBs.
- Scrap Metal Working Area (Area 4)—Contaminants detected above background levels include cadmium, copper, lead, mercury, TPH, PCBs, TEPH, and TVPH.
- Scrap Metal Yard (Area 5)—Contaminants detected above background levels include cadmium, copper, lead, mercury, TPH, PCBs, and TEPH.
- Fill Area (Area 6)—Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, thallium, zinc, TPH, and TEPH.
- Eastern Refuse Area (Area 9)—Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, zinc, TPH, and TEPH.
- Central Refuse Area (Area 10)—Contaminants detected above background levels include cadmium, copper, lead, nickel, selenium, zinc, TVPH, and TEPH.
- Tire Refuse Area (Area 11)—Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, vanadium, zinc, and TPH.
- Auto Repair Shop (Area 13)—Contaminants detected above background levels include antimony, copper, lead, mercury, molybdenum, selenium, zinc, TPH, and BTEX.
- Drum Area (Area 18)—Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, zinc, and TPH.

Based on the levels measured, the soil contaminants are not above hazardous waste levels and are, therefore, not significant. Groundwater sampling at various locations on the property identified low concentrations of a number of heavy metals, including arsenic, barium, molybdenum, vanadium, selenium, silver, and zinc, as well as VOCs. ~~However,~~ N~~n~~one of these constituents, however, was detected at concentration levels above state action levels for drinking water. On the basis of these soil and groundwater samples and analytical results, the ESA reported that none of the samples contained compounds at hazardous concentrations. The following recommendations were made:

- Scrap Metal Working Area (Area 4)—Remediation by removal of 140 cubic yards of soil containing lead and PCBs.
- Scrap Metal Yard (Area 5)—Remediation by removal of 50 cubic yards of soil containing lead.
- Drum Area (Area 14)—Remediation by removal of lead contamination, including excavation, and stockpiling of soil.
- Areas 9, 10, 11, and 13—Removal and proper disposal of debris (automobiles, parts, tires, construction debris, scrap metal, and industrial debris).

2.7.3.2 Environmental Site Assessment – South Bay Water Reclamation Plant and Dairy Mart Road EIR/EA

In April 1995, a Phase I ESA was conducted in support of an Environmental Impact Report/ Environmental Assessment (EIR/EA) prepared for the South Bay Water Reclamation Plant and Dairy Mart Road and Bridge Improvements project (City of San Diego, 1997). A portion of this ESA focused on the San Ysidro Drum site, which is an area of potential contamination located to the west of the project site. This ESA noted that the San Ysidro site contained a large collection of drums of unknown contents, as well as other miscellaneous debris. The reclamation plant EIR/EA notes that review of County of San Diego Department of Environmental Health files indicated that hazardous substances at the site had been properly disposed of; however, these files also indicate that the potential for and extent of soil and groundwater contamination at the San Ysidro site from previous improper storage of hazardous materials has yet to be determined.

2.7.4 Public Health and Safety—Mexico

2.7.4.1 Public Health and Safety - Mexico

Immediately south of the SBIWTP along the U.S.-Mexico border, lies the municipality of Tijuana, Baja California, Mexico. In contrast to the rural, sparsely-populated, and primarily agricultural land uses which surround the project site~~s~~ north of the border, Tijuana is a predominantly high density residential and/or commercial area~~,~~ with isolated pockets of heavy industry. Detailed information characterizing potentially sensitive receptors within this area was not available at the time this ~~Draft~~ SEIS was prepared. A~~However, a~~ccording to information compiled by the University of California, San Diego, however, in 1990 approximately 12 to 15 percent of the Tijuana population proximate to the SBIWTP was under age 5, and 3 to 5 percent was over age 65 (UCSD, 1995). Given this lack of specific data, the nature and attributes of the current Tijuana/Mexican environment from a public health and safety perspective have not been addressed or quantified further within the SEIS.

Other health and safety conditions and considerations may be present concerning sludge disposal. These conditions will be addressed by Mexico when it~~Mexico~~ selects the sludge disposal site in Mexico.

2.8 Scenic, Visual, and Recreational Resources

The following section summarizes the scenic, visual, and recreational resources within the vicinity of the project area.

2.8.1 Scenic/Visual Resources

2.8.1.1 SBIWTP Vicinity

The alternatives under consideration in the vicinity of the SBIWTP are located in a predominantly rural section of the City of San Diego immediately north of the U.S.-~~/~~Mexico border near the Tijuana River. The broad flat valley of the Tijuana River and estuary contains extensive riparian areas with both saltwater and freshwater marshes. Agricultural lands, both actively cultivated and fallow, lie next to and in the floodplain. Steep slopes rise sharply from the valley floor to upland mesas to the south. The boundary between the United States and Mexico is clearly defined by the visual contrast between the mostly undeveloped open space areas north of the boundary and the densely developed urban areas south of the boundary. The border fence is parallel to the roadway, and related border activities are visually prominent aspects of the project vicinity. Upland hills to the north and northeast have undisturbed natural areas covering the upper elevations and developed urban areas below.

The newly constructed SBIWTP is a prominent feature in the immediate project area viewshed, visible to surrounding areas approximately 1.25 to 1.5 miles (2 to 2.24 km) to the east and northeast in the valley, to elevated hills approximately 1.5 to 2.5 miles (2.24 to 4 km) north and northeast.

2.8.1.2 Hofer Site

The area surrounding the Hofer site includes agricultural pastureland and upland, and disturbed areas containing a sand and gravel quarry. Views of the SBIWTP and Hofer site from the residential areas and I-5 to the north and east are mostly screened by dense vegetation or buildings. Views from the west are screened by the ridgeline.

Overall, the visual sensitivity of the Hofer site is considered to be low due to the distance from which most viewers see this site and the low volume of residential, recreational, and roadway use that occurs within one-half mile (0.8 km) of the site.

2.8.1.3 Spooner's Mesa Site

Spooner's Mesa is an undeveloped plateau rising from the valley floor and reaching approximately 350 feet (107 m) higher in elevation than the SBIWTP. The site is characterized by steep side slopes and a gently undulating top. The site is mostly open space, with evidence of some past agricultural activities. Looking west from the mesa, the

South Bay coast and ocean can be seen. Views of the top of Spooner's Mesa are essentially negligible from within the United States.

2.8.2 Recreation

A discussion of existing recreational areas in the project vicinity is provided in Section 2.4, Land Use. This section discusses specific recreational activities along the South Bay beaches and ocean waters.

Coastal recreation in San Diego County encompasses a full range of activities involving beaches, seaside parks, coastal water sports, diving, boating and sportfishing. The County has 72 miles (116 km) of coastline and 52 designated beaches and parks, 11 of which occur in the Point Loma-South Bay area.

Public recreation at South Bay beaches has been limited as a result of periodic beach closures from discharges of contaminated sewage via the Tijuana River and Punta Bandera, and seasonal northerly moving currents. In the past, the Department of Health Services (DHS) has imposed repeated quarantines on beaches from the United States-Mexico boundary to Imperial Beach and has occasionally closed beaches as far north as Coronado. As a result, beach recreation and coastal water sports were limited in these areas. During the summer of 1997, water quality conditions improved and beaches remained open to the international border. Horseback riding is common in the Imperial Beach area, one of the few remaining beach areas in California that still allows horses.

Although recreational boating is popular in the San Diego area, most boats are docked or launched in San Diego and Mission Bays, and the South Bay is rarely visited by recreational boaters. Sailboats and powerboats usually cruise through the South Bay area well offshore.

Shore and pier fishing is prevalent in the South Bay. The Imperial Beach fishing pier is 2 miles (3 km) north of the SBOO. Sportfishing from private and chartered boats traveling south out of San Diego harbor are usually bound for the Coronado Islands, bypassing the inshore waters. Occasional charter boats, however, will fish the small kelp beds off Imperial Beach or rockfish grounds in deeper water.

Whale watching is another popular activity throughout Southern California. From February to March, whales migrate north to Alaska and swim closer to shore. Although many chartered boats are available for whale watching, only an occasional whale-watching boat passes through the South Bay area.

2.8.3 Scenic, Visual, and Recreational Resources – Mexico

The viewshed from Tijuana consists of the Tijuana River valley and estuary, urban areas to the north, and the ocean to the west. The newly constructed SBIWTP is a prominent feature in the immediate viewshed. The facility is visible from higher elevation portions of Tijuana to the southwest. The SBIWTP can be viewed from the highway and residences. The SBIWTP has the appearance of an industrial facility located in a rural setting. Spooner's Mesa is more prominently visible because of its high elevation. The top of Spooner's Mesa has the appearance of undeveloped, open-space grasslands. Spooner's Mesa does not provide recreational resources for Mexico.

2.9 Air Quality

This section presents the existing conditions for air quality, including meteorology, air quality conditions, and odor.

2.9.1 Meteorological Conditions

The project area, like the rest of San Diego County's coastal areas, has a cool semiarid steppe climate characterized by warm, dry summers and mild, wet winters. The dominating permanent meteorological feature affecting the region is the Pacific high pressure zone, which produces prevailing westerly to northwesterly winds. The project area has a mean annual temperature of 62° F (16.7° C) and an average annual precipitation of 9.5 inches (24.1 cm), falling primarily from November to April. Winter low temperatures in the vicinity of the SBIWTP average about 45° F (7.2° C), and summer high temperatures average about 75° F (23.9° C) (U.S. Department of Commerce, 1992; Pryde, 1976).

Prevailing conditions along the coast are modified by the daily sea breeze/land breeze cycle. Fluctuations in the strength and pattern of winds from the Pacific high pressure zone, interacting with the daily local cycle, produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the San Diego Air Basin (SDAB). The afternoon temperature inversion height, beneath which pollutants are trapped, varies between 1,500 and 2,500 feet (457 and 762 m) above mean sea level (MSL). The altitude beneath the inversion layer is the mixing depth for trapped pollutants. In winter, the morning inversion layer is about 800 feet (244 m) above MSL. Project area elevations range from sea level to an approximate high of 45 feet (13.7 m) above MSL, except at Spooner's Mesa where elevations exceed 400 feet (122 m) MSL. In summer, the morning inversion layer is about 1,100 feet (335 m) above MSL. A greater change between morning and afternoon mixing depth increases the ability of the atmosphere to disperse pollutants. As a result, the air quality in the project area is generally better in winter than in summer.

The predominant pattern is sometimes interrupted by the Santa Ana conditions, when high pressure over the Nevada-Utah area overcomes the prevailing westerlies, and sends strong, steady, hot, dry northeasterly winds over the mountains and out to sea. Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. At the onset or breakdown of these conditions, or if the Santa Ana condition is weak, air quality can be adversely affected. In these cases, emissions from the South Coast Air Basin to the north are blown out over the ocean, and low pressure over Baja California draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterlies return and send this cloud of contamination ashore in the SDAB. There is a potential for such an occurrence about 45 days of the year, but San Diego is adversely affected on only about 5 of these days. When this event does occur, the combination of transported and locally produced contaminants produces the worst air quality measurements recorded in the basin.

2.9.2 Air Quality Conditions

2.9.2.1 Existing Air Quality

The project area is within the SDAB. Air quality at a particular location is a function of: (1) the kinds and amounts of pollutants being emitted into the air locally and throughout the basin and (2) the dispersal rates of pollutants within the region. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards set by the California Air Resources Board (CARB) and federal standards set by the EPA. Ambient air quality standards are shown in Chapter 5. The concentration of pollutants within the SDAB is measured at 10 stations maintained by the County of San Diego Air Pollution Control District (APCD, 1992) and CARB (1990-1996). The station nearest the project area measuring a full range of pollutants is in Chula Vista. This station does not monitor lead concentrations. The 1993 lead levels measured at other monitoring stations in the SDAB, however, were well below both federal and state standards.

The number of days annually from 1989 to 1993 during which state and federal standards were exceeded in the SDAB overall is presented in Table 2.9-1. These same parameters for the Chula Vista monitoring station are shown in Table 2.9-2.

Table 2.9-1
SUMMARY OF AIR QUALITY DATA FOR THE SAN DIEGO AIR BASIN

	Number of Days Over Standard							
	State					Federal		
Pollutant	1991	1992	1993	1994	1995	1993	1994	1995
Oxidant (ozone)*	106	97	89	79	96	14	9	12
Carbon monoxide	0	0	0	0	0	0	0	0
Sulfur dioxide	0	0	0	0	0	0	0	0
Nitrogen dioxide	0	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0	0
Particulates (PM_{10})**	20/83	7/75	14/76	30/87	30/88	0/76	***	***

Source: State of California; 1992, 1993, 1994, 1995, 1996.
* State Standard for Ozone > 0.09 ppm/hour; Federal Standard > 0.12 ppm/hour.
** Number of samples over standard/number of samples collected.
***Data not reported for this year.

Ozone

The SDAB is currently designated a state "serious" nonattainment area and a federal "serious" nonattainment area for ozone. Even though peak ozone concentrations have steadily declined since 1978 (SANDAG, 1994), in 1993, 1994, and 1995, the SDAB exceeded the federal ozone standard on 14, 9, and 12 days, respectively, as shown in Table 2.9-1. During the same 3 years, the state ozone standard was exceeded on 89, 79, and 96 days, respectively.

Ozone presents special control strategy difficulties in the SDAB because of climatological and meteorological factors. Ozone is the end product of the chain of chemical reactions that produces photochemical smog from hydrocarbon emissions. A major source of hydrocarbon emissions is motor vehicle exhaust. In the SDAB, only part of the ozone contamination is derived from local sources; under certain conditions, contaminants from the South Coast Air Basin (such as the Los Angeles area) are windborne over the ocean into the SDAB. When this happens, the combination of local and transported pollutants produces the highest ozone levels measured in the basin.

Table 2.9-2
NUMBER OF DAYS AIR QUALITY STANDARDS WERE EXCEEDED AT CHULA VISTA MONITORING STATION

	Year				
Pollutant	**1991**	**1992**	**1993**	**1994**	**1995**
Ozone	3	4	1	n/r	n/r
Federal 1-hour standard (0.12 ppm, 235 µg/m^3)	n/a	n/a	n/a	n/a	1
State 1-hour standard (0.09 ppm, 180 µg/m^3)	13	14	12	4	7
Carbon monoxide					
Federal 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	0	0
State 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	0	0
State 1-hour average (20 ppm, 23 mg/m^3)	0	0	0	0	0
Nitrogen dioxide					
Federal annual average (0.053 ppm, 100 µg/m^3)*	0.023	0.022	0.020	0.021	0.020
State 1-hour standard (0.25 ppm, 470 µg/m^3)	0	0	0	0	0
Sulfur dioxide					
Federal annual average (0.03 ppm, 80 µg/m^3)*	0.002	0.002	0.001	0.001	0.002
State 1-hour average (0.25 ppm, 655 µg/m^3)	0	0	0	0	0
State 24-hour average (0.04 ppm, 105 µg/m^3)	0	0	0	0	0
Suspended 10-micron particulate matter (PM_{10})					
Federal 24-hour average (150 µg/m^3)†	0/60	0/60	0/60	0/60	0/59
Federal annual arithmetic mean (50 µg/m^3)‡	33.8	29.0§	27.0	28.0	32.4
State 24-hour average (50 µg/m^3)†	7/60	2/60	2/60	2/60	6/59
State annual geometric mean (30 µg/m^3)‡	30.9	27.4§	24.7	33.0	29.2

SOURCE: State of California 1992, 1993, 1994, 1995, 1996.

ppm parts per million
mg/m^3 milligrams per cubic meter
µg/m^3 micrograms per cubic meter
* Data shown in ppm
† Number of samples over standard/number of samples collected
‡ Data shown in µg/m^3
§ Data points are valid, but an insufficient number were collected to meet EPA and/or CARB representative criteria.
n/r not reported
n/a not available

At the Chula Vista station, the federal standard was exceeded on 1 day in February and the state standard for ozone was exceeded on 7 days in 1995.

On average, approximately 42 percent of the days over state standards since 1987 were attributable to pollution transported from Los Angeles (SANDAG, 1994:249-250). The 1994 Regional Transportation Plan concludes that ozone remains the major primary pollutant in the San Diego region.

Local agencies can control neither the source nor the transport of pollutants from outside the basin. The APCD's policy, therefore, has been to control local sources effectively enough to reduce locally produced contamination to clean air standards.

Carbon Monoxide

No violations of the state standard have been recorded for carbon monoxide since 1990, and the basin is classified as a state attainment area for carbon monoxide. The basin is currently classified as a federal nonattainment area for carbon monoxide; however, no violations of the federal standard have been recorded since 1989. The APCD is currently in the process of applying for reclassification of the basin as a federal attainment area for carbon monoxide. Moreover, it should be noted that the state standard for carbon monoxide is more stringent than the federal standard.

Particulates (PM_{10})

Particulates within the respirable range (10 microns in size or less) are reported as both an annual average and a 24-hour average. The basin overall is currently in attainment of the federal standard but has not met the more stringent state standard. For several reasons, hinging on the area's dry climate and coastal location, the SDAB has special difficulty in developing adequate tactics to meet present particulate standards.

Nitrogen Dioxide, Sulfur Dioxide, and Lead

The basin is in attainment for these pollutants.

2.9.3 Odors

Odors are not regulated under emissions standards; rather, they are regulated under the APCD's Regulation IV, Rule 51 (the "nuisance" rule). An odor is considered a nuisance based on the number of complaints received by the APCD.

Complaints of odors result primarily from the perceived intensity of the odor sensation and the frequency of occurrence. People judge the intensity of odors they consider unpleasant as higher than those they consider pleasant or normal to their environment. The range in olfactory sensitivity in people of normal acuity can vary up to four orders of magnitude relative to measured concentrations. Few odors are attributable to a single compound.

A method of quantitatively assessing odors has been devised by the American Society of Testing Materials (ASTM, Standard Method D 1391), which considers how many times an air sample must be diluted with "clean" air before the odor is no longer detectable to an average adult with average odor sensitivity. The number of dilutions needed to reach this threshold level is referred to as a "dilution to threshold" (D/T) factor. A threshold level of perception for an odor is 2 D/T (two parts of fresh air to one part of odorous air); at this value, approximately 50 percent of people can detect the presence of an odor. The South Coast Air Quality Management District (SCAQMD) uses a value of 10 D/T as a screening threshold for determining significant impacts due to odor (SCAQMD, 1993:6-3). The SDAPCD has no comparable threshold level, but uses the SCAQMD value as a guideline. There is no established correlation, however, between odor threshold values and annoyance.

The SBIWTP is in a rural area of the Tijuana River valley surrounded by agricultural and livestock activities and a few isolated residences. Odors detected during previous odor surveys in the area prior to the construction of the SBIWTP (Odor Science and Engineering, 1990) were manure odors from a local farm, which measured less than 2 D/T. Since release of the Draft EIS for the SBIWTP, the City of San Diego approved a new residential development (Coral Gate) for the Tijuana Street site. This approval would add sensitive receptors approximately 1,700 feet (518 m) northeast of the SBIWTP.

Although the odor surveys found the ambient odor conditions in the vicinity of the SBIWTP to be acceptable, comments received at a previous public meeting indicated that the existing odor of the Tijuana River was foul and unacceptable. Foul-smelling odors also have been detected by USIBWC personnel at the SBIWTP site.

The SBIWTP underwent an APCD performance certification in April 1997, which included testing of the odor control systems in the facilities to determine compliance with the design specifications and APCD performance requirements. The SBIWTP odor control facility performance exceeded the H_2S design performance and permit requirements.

A hydrogen sulfide (H_2S) and odor study (Malcolm Pirnie, 1997a) assessed the odor-producing sources within the Tijuana River valley, including the SBIWTP, the buffer area between Mexico and the U.S., Stewart's Drain, and the new Coral Gate development. The study was conducted by sampling H_2S and by modeling odor production and transport. This study drew several conclusions about odor in the project area. The advanced primary SBIWTP is currently operating well within the APCD's H_2S permit limit of 42 μg/m^3 and the City of San Diego's threshold value of 5 odor units (OUs) beyond the fenceline.

The study evaluated~~looked at~~ other possible odor sources in the area and indicated localized odor-generating "hot spots." The hydrogen sulfide results from the border sampling locations were higher over the 7-day sampling period than those at the plant fenceline. Emissions from Stewart's Drain and several areas of standing water were identified as odor sources, emitting a sewage odor. Likewise, strong odors were traced to the intersection of Dairy Mart Road and Camino de la Plaza.

Table 2.9-3 summarizes the 7-day sampling period average and peak values of hydrogen sulfide in parts per million (ppm). Values at the fenceline of the SBIWTP are lower than the average and peak values found at monitoring points established near Stewart's Drain at the U.S./Mexico border. This indicates that odor sources other than the plant are causing higher levels of odor than the plant itself. Sampling at the primary sedimentation tanks produced relatively low results (8 to 36 parts per billion), consistent with the quiescent surface of the water.

Table 2.9-3
SUMMARY OF HYDROGEN SULFIDE RESULTS (PPM)
Average from 7-Day Sampling Period (10/29/97—11/04/97)

SBIWTP Fenceline		U.S./Mexico Border		Coral Gate Development		Primary Sed Tank
Average	Peak	Average	Peak	Average	Peak	
0.012	0.027	0.020	0.043	0.012	0.021	0.017

ppm = parts per million
Source: Malcolm-Pirnie, November 1997

2.9.4 Ambient Air Quality and Odors—Mexico

Mexico has established similar ambient air quality standards to the United States for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter of 10 micrometers or less in diameter (PM_{10}). These standards are provided in Chapter 5 in Table 5.2~~.9~~-8.~~4 shows the Mexican health-based ambient air quality standards.~~

Historically, there has been no regular monitoring of air quality for Mexican border cities. However, recently air quality monitors have been installed in Tijuana and other border cities under a cooperative program between SEMARNAP, EPA, and CARB. Quality-assured and controlled measurements of air quality are now available for 12 monitoring sites along the San Diego / Tijuana border, including 4 in Tijuana.

Air quality data is available from the CARB monitoring program for a 1-year period at two monitoring stations in Tijuana near the border, the Las Playas station to the west, and the Instituto Technologico de Tijuana (ITT) station to the east. Tables 2.9-4~~5~~ and 2.9-5~~6~~ summarize the actual high, average high, actual low, and average low levels of each pollutant for the 12-month period and the median (average) 1-hour level over the 12 months. Tables 2.9-6~~7~~ and 2.9-7~~8~~ compare the annual monitoring data from these two stations in Tijuana with the Mexico ambient air quality for the 12-month period. Although for these four pollutants monitored at the two Tijuana stations there were days when the standards were exceeded, the ambient air quality for the 12-month period is below the Mexican standards.

Table 2.9-4~~5~~
SUMMARY OF ANNUAL AMBIENT AIR QUALITY
LAS PLAYAS MONITORING STATION, TIJUANA, MEXICO

Pollutant	High	High (avg.)	Low	Low (avg.)	Median
O_3 (ppb)	200.00	84.15	0.00	1.33	25.55
NO_x (ppb)	526.40	157.83	0.00	0.98	20.04
NO_2 (ppb)	165.50	74.67	0.00	0.49	13.38
CO (ppm)	48.07	15.12	0.00	0.02	0.97
SO_2 (pphm)	21.64	5.48	0.00	0.08	0.31

Notes:
Source: California Air Resources Board, 1997

ppb = parts per billion
ppm = parts per million
pphm = parts per hundred million

Table2.9-~~5~~6
SUMMARY OF ANNUAL AMBIENT AIR QUALITY
ITT MONITORING STATION, TIJUANA, MEXICO

Pollutant	High	High (avg.)	Low	Low (avg.)	Median
O_3 (ppb)	173.60	89.63	0.00	0.00	20.27
NO_x (ppb)	309.30	170.00	0.00	1.19	22.92
NO (ppb)	240.40	116.74	0.00	1.02	8.29
NO_2 (ppb)	215.00	85.71	0.00	0.40	15.06
CO (ppm)	17.54	7.05	0.00	0.10	0.95
SO_2 (pphm)	17.02	4.72	0.00	0.00	0.42

Notes:
Source: California Air Resources Board, 1997
ITT = Instituto Tecnologico de Tijuana
ppb = parts per billion
ppm = parts per million
pphm = parts per hundred million

Table 2.9-~~6~~7
AMBIENT AIR QUALITY FOR TIJUANA (NOVEMBER 1996 THROUGH OCTOBER 1997)
LAS PLAYAS MONITORING STATION

	Mexico Standard			Las Playas Monitoring Station		
Pollutant	Concentration	Units	Average	Concentration	Units	Average
O_3	0.11	ppm	1 hour	0.026	ppm	1 hour
SO_2	0.13	ppm	24 hour	0.001	ppm	24 hour
NO_2	0.21	ppm	1 hour	0.013	ppm	1 hour
CO	11	ppm	8 hours	0.679	ppm	8 hour

Source: California Air Resources Board, 1997

Table 2.9-78
AMBIENT AIR QUALITY FOR TIJUANA (AUGUST 1996 THROUGH JULY 1997)
ITT MONITORING STATION

	Mexico Standard			ITT Monitoring Station		
Pollutant	Concentration	Units	Average	Concentration	Units	Average
O_3	0.11	ppm	1 hour	0.020	ppm	1 hour
SO_2	0.13	ppm	24 hour	0.002	ppm	24 hour
NO_2	0.21	ppm	1 hour	0.015	ppm	1 hour
CO	11	ppm	8 hours	0.665	ppm	8 hour

Source: California Air Resources Board, 1997

Based on measurements over the last year, broad conclusions can be drawn about Mexican ambient air quality. PM_{10} is a problem in Tijuana with standards being exceeded. The average emissions in Tijuana appear to be about 10 percent greater than in San Diego. Without substantiation possible sources of PM_{10} could be unpaved roads, agricultural activities, and uncontrolled emissions during construction. Airborne lead does not appear to be a problem in Tijuana and the lead standards are not exceeded.

Odor sources in Tijuana have not been substantiated by testing. Potential sources of odors in the vicinity of the SBIWTP and Hofer site are Pump Station One, surface drainages, and vehicular emissions on International Avenue and other roads. Pump Station One handles average flows of about 38 mgd (1,664 ~~-~~L/s) of untreated sewage. Pump Station One is not equipped with odor control scrubbers. Surface drains may contain stormwater, sewage, and other sources of water that will create odors if allowed to stagnate.

The distance from the SBIWTP to the border is 300 feet (91 m). The distance to residential areas is about 600 feet (182 m). The low hydrogen sulfide levels detected at the SBIWTP fenceline and the low odor levels predicted by the model suggest that odors from the SBIWTP are not an existing nuisance or concern.

2.10 Geology

The following discussion is a summary of the geology of the Tijuana River valley~~Tijuana River Valley~~ and ocean floor in the vicinity of the SBOO.

2.10.1 Regional Geology

The project area is located within a coastal plain characterized by a series of wave-cut terraces that extend inland for approximately 10 miles (16 km). These terraces have been dissected by various rivers forming a series of wide alluvium-filled valleys. The Tijuana River valley, formed by the Tijuana River, is typical of these alluvium-filled valleys.

Alluvial soils found within these valleys consist primarily of poorly consolidated stream deposits of silt, sand, and cobble-sized particles originating from bedrock sources in the vicinity. Underlying the alluvium and exposed in the bluffs of the Border Highlands to the south and east are Tertiary-age deposits of the San Diego Formation. The Tertiary-age sediments are estimated to range in thickness from 3,000-4,000 feet (915-1,220 m) at the mouth of the Tijuana River. This formation is locally underlain by a thin veneer of early Pleistocene nonmarine sediments of the Lindavista Formation, deposited on the upper terraces. Lower terraces are mantled by late Pleistocene deposits of the Bay Point Formation that also overlie the San Diego Formation.

2.10.2 Local Faulting

The project area is within a seismically active region subject to the effects of moderate-to-large earthquake events along major faults. The regional faults that could affect the project area include the Rose Canyon, Silver Strand, Coronado Bank, Coronado Shelf, Elsinore, San Jacinto, La Nacion, and San Andreas faults. Those faults nearest to the project area are the Rose Canyon, Silver Strand, Coronado Banks, and Coronado Shelf. These faults are shown in Figure 2.10-1.

The Rose Canyon fault is a north-to-northwest-trending, complex zone of onshore and offshore faults. It is closest to the SBIWTP, extends across the San Diego Bay and end of Mission Bay before continuing up Rose Canyon and out to sea north of La Jolla approximately 14 miles (22.5 km) north of the SBIWTP. The offshore Rose Canyon fault zone includes numerous small- to medium-length faults. The actual number is not well known. These smaller faults, however, are presumed to be in the area of the SBOO.

The Rose Canyon fault zone is the closest major active fault zone. Estimates of the maximum potential earthquake range from magnitude 6.5 to 7.25, with a maximum 7.0 earthquake typically considered in local seismic hazard evaluations. Significant traces of the Rose Canyon fault zone are mapped at distances ranging from about 0.5 mile to about 3 miles (0.8-4.8 km) from the project area. Recent probabilistic seismic hazard analyses for the San Diego–Tijuana coastal region indicated that the level of seismic shaking associated with a 10 percent probability of exceedance for a 75-year period ranges from about 0.45 gravities (*g)* to 0.48 *g*.

A secondary extension of the Rose Canyon fault zone complex is known as the La Nacion–San Ysidro fault zone, which extends north and northeast of the Tijuana River valley~~Tijuana River Valley~~. Mapped fault traces also extend south into Mexico as the Los Buenos faults. These faults are last identified as active during the late Pleistocene and are considered potentially active.

The Silver Strand fault is the principal fault in the study area. Although the activity of this fault is based on seismic reflection data, much existing data suggest a strong possibility of Holocene faulting, which is consistent with the repeated Holocene activity seen on the adjoining onshore segment of the Rose Canyon fault zone to the north.

The Coronado Bank fault zone is located approximately 7.5 miles (12 km) offshore. It is a complex zone of faults and folds believed to extend onshore in the Los Angeles and Ensenada areas. On the basis of Holocene-age displacement of sediments near the ocean floor, various faults within this fault zone are believed to be active.

Figure

2.10-1 Regional Fault Map

(8-1/2 x 11)

Slipsheet

The Coronado Shelf fault zone, which is located about 2.5 miles (4 km) west of the end of the SBOO, consists of a series of northwest-trending faults that extend from several miles southwest of the tip of Point Loma to the area several miles offshore from Tijuana. The zone of faults appears to consist of two relatively continuous strands that extend about 10 miles (16 km) across the inner shelf off San Diego.

2.10.3 Historical Earthquake Activity

Since the 1700s, only a limited number of small earthquakes have been reported within a 50-mile (80 km) radius of the San Diego area. On this basis, the San Diego area is not characterized as a high, seismically active area (Seismic Zone 3). Strong earthquakes originating from long distances such as the Imperial Valley or Baja California have produced strong shaking and minor damage in San Diego, but no major destruction has occurred in the area. Earthquakes occurred in 1800, 1862, and 1892 of estimated maximum Modified Mercalli (MM) intensity of VII, VI-VII, and VI, respectively, and appear to have had the strongest intensities in downtown San Diego. Recently, only small- to moderate-magnitude earthquakes have occurred in the area, the largest of which was a magnitude 5.3 on the Richter scale in July 1986.

2.10.4 Seafloor Conditions

About 20 to 40 feet (6.1 to 12.2 m) of finer-grained sands, silts, and sparse clay layers underlie the eastern two-thirds of the ocean outfall alignment. A varying thickness of up to 40 feet of gravely and sandy alluvial deposits underlies the upper material. Varying depths of deeper, unconsolidated sediments underlie the sandy layers. These soils are subject to liquefaction and settlement due to ground shaking and significant wave height. Tertiary sediments of the San Diego Formation are found at depths of approximately 115 feet (35 m).

2.10.5 Geology of the SBIWTP and Hofer Site

The Hofer site is adjacent to the SBIWTP. The site consists of the Hofer parcel plus a triangular-shaped parcel owned by USIBWC adjacent to the Hofer parcel on the northeast side. The size of the combined parcels that comprise the Hofer site is 43 acres (17.4 ha).

The Hofer site is characterized as being underlain with fill, alluvium, alluvial fan deposits, old alluvial fan deposits, and terrace deposits (Woodward-Clyde, 1994). Soils are characterized as variably-graded, fine to coarse sands with medium to low amounts of fines (silts and clays). Rocky zones at variable depths contain larger amounts of gravels, cobbles, and localized boulders. Higher elevations to the south were identified as conglomerate San Diego formation. The most significant constraint to development of the SBIWTP was the relatively loose upper alluvial deposit in a saturation-prone area being highly susceptible to earthquake-induced liquefaction (Woodward-Clyde, 1994).

Groundwater levels at the site are high due to the proximity of the Tijuana River. At the SBIWTP, maximum seasonal groundwater elevations were estimated at 28.5 to 35 feet (8.7 to 10.67 m) MSL (Woodward-Clyde, 1994).

2.10.6 Geology of the Spooner's Mesa Site

The Spooner's Mesa site is located about 2 miles (3.2 km) west and up to 350 feet (107 m) higher than the SBIWTP. The site is partly owned by the County of San Diego and by CalMat. Mineral rights are attached to this property. The site topography is characterized by a mesa with steep side slopes and gently undulating top. Top elevations range from about 275 feet (84 m) MSL to 406 feet (124 m) MSL. The area of the top is estimated to be 135 acres (55 ha), approximately 59 acres (24 ha) of which would require substantial grading for the proposed AIPS alternative.

Geotechnical information about the Spooner's Mesa site is limited. Geotechnical investigations of Smuggler Gulch and Goat Canyon (Woodward-Clyde, 1994) provide information about the geology of the mesa's east and west side slopes. The lower east and west side slopes are characterized as young alluvium and alluvium. The upper slopes of the west side are characterized predominantly as conglomerate San Diego formation. Visual observation of the soil from road cuts along the mesa sides confirms the sedimentary soil structure composed of alternating strata of coarse to very coarse soils (sands to cobbles).

Groundwater elevations at the mesa top are not available. Groundwater elevations in Goat Canyon were identified between 6 and 15 feet (1.8 to 4.6 m) MSL.

2.10.7 Geology—Mexico

Implementation of the proposed Action is not anticipated to affect or be affected by the geological characteristics of Mexico. Therefore, the specific nature and attributes of the geologic environment have not been addressed or quantified further within the present SEIS.

2.11 Noise

This section presents the affected environment setting for noise, including regulatory setting and ambient noise conditions.

2.11.1 Ambient Noise at the SBIWTP and Hofer Site

In the United States, the predominant land uses in the immediate vicinity of the SBIWTP are an inactive quarry and agricultural pastureland. The nearest residential property is a condominium / apartment complex near the I-5 / Dairy Mart Road interchange, approximately 1.2 miles (1.8 km) north of the SBIWTP. The Coral Gate development, a planned residential community, is under construction about 1,200 feet (456 km) from the site.

Ambient noise measurements were taken in 1991 and 1992 prior to construction of the SBIWTP, as discussed in the 1994 Final EIS (RECON, 1994). In September 1991, the 24-hour average noise level measured at the northwest corner of the site was 50.6 dBA L_{eq}. The 1-hour averages during this time ranged from 42.7 dBA L_{eq} at midnight to 58.6 dBA L_{eq} at 9:00 AM. The dominant noise sources during the 24-hour measurement were operations at the Nelson and Sloan sand and gravel facility (no longer in operation), traffic on Monument Road, helicopter and jet overflights, and radio-controlled model airplanes. During January 1992, noise was measured at the same location for a continuous 2-week period. The average for the 2-week period was 53.5 dBA L_{eq}. The daily averages during this time period ranged from 48.4 dBA L_{eq} to 59.8 dBA L_{eq}.

The 1996 South Bay Reclamation Plant and Dairy Mart Road and Bridge Improvements EIR/EA included noise measurements taken 50 feet (15 m) north of the intersection of the Dairy Mart Road centerline near the Monument Road intersection. The 24-hour CNEL measured at this location was 67 dBA, and the peak hour L_{eq} was 70 dBA. The main source of noise was attributed to vehicle traffic, including construction vehicles to and from the SBIWTP site and equipment at the site.

Since those noise measurements were taken, the SBIWTP has been constructed and operated on a limited basis. Although no actual noise measurements have been taken, operation of the SBIWTP is projected to increase ambient noise levels to 67 dBA L_{eq} at 50 feet from the source during full operation for primary treatment (Interim Operation SEIS, 1996). This is considered a noise level that is compatible with the surrounding agricultural and livestock land use.

2.11.2 Ambient Noise at the Spooner's Mesa Site

Noise levels at Spooner's Mesa are primarily dominated by road traffic from the Ensenada Highway that fronts the border below Spooner's Mesa. In general, noise levels throughout the Tijuana River valley~~Tijuana River Valley~~ vary due to the predominance of helicopter activity. CNEL contours generated by the Naval Facilities Engineering Command for the Air Installation Compatible Use Zones (AICUZ) covering the entire Tijuana River valley~~Tijuana River Valley~~ show KNELL values ranging from 65 to 75 dBA.

2.11.3 Noise—Mexico

The existing noise environment of this area is expected to be typical of a highly developed urban setting with mixed residential, commercial, and industrial land uses. Detailed information characterizing the existing noise environment within this area was not available at the time this Draft SEIS was prepared. However, it is known that the International Avenue highway that parallels the border in the project vicinity is a major transportation corridor used by all types of vehicles including trucks and buses. The noise level produced from the highway is considerable and is the dominating noise feature of the area.

2.12 Energy Consumption

The affected environment for energy consumption includes existing consumption patterns associated with the operation of the SBIWTP. The primary energy resources of concern include fossil fuels, electricity, and natural gas.

2.12.1 Fossil Fuels

As with other regions in California, virtually all fossil fuel (gasoline and diesel) consumption in San Diego takes place in the transportation sector. Information from SANDAG indicates that, in 1990, transportation-related gasoline and diesel fuel consumption within the San Diego region totaled approximately 877 and 77 million gallons (3,987 and 350 million liters), respectively (SANDAG, 1994). During this period, gasoline-and diesel-fueled vehicles traveled an average of approximately 50.4 million miles (81,1 million km) per day. SANDAG further estimates a total regional vehicle gasoline and diesel fuel consumption of approximately 922 and 89 million (4,191 and 404.5 million liters) per year, respectively, by the year 2010.

2.12.2 Electricity and Natural Gas

Electrical energy and natural gas for the San Diego County area are supplied by San Diego Gas & Electric (SDG&E). For the 12-month period ending May 1997, 16,145 million kilowatt-hours of "on-system sales" were reported within SDG&E's San Diego service area. SDG&E projects that the total electrical energy sales for the year 2005 will be 19,884 million kilowatt hours (kWh) (SDG&E, 1997). These electrical energy consumption levels are somewhat lower than those reported or forecasted for the SDG&E service area by the California Energy Commission (CEC) in its latest Electricity Report (CEC, 1997). The CEC reports consumption levels of 16,641 and 17,118 million kWh for 1996 and 1997, respectively, for the SDG&E service area. The CEC further forecasts electrical energy consumption at a level of 21,118 million kWh for the year 2005. SDG&E's 1996 Statistical Report indicates that approximately 43.5 percent of this electrical energy is generated within the San Diego County service area, and 56.5 percent is purchased or imported power. This split has reportedly remained fairly constant since 1991 (SDG&E, 1997).

With regard to natural gas demand within the San Diego region, SANDAG reported a total of 540.5 million therms consumed by the residential, commercial, industrial, and public facilities sectors in 1990 (SANDAG, 1994). SDG&E, for the 12-month period ending May 1997, reported "on-system" retail sales of 519.9 million therms of natural gas within SDG&E's San Diego service area. Added to the 169.3 million therms of natural gas also transported but not sold by SDG&E to customers within its service area during this same period, yields a reported total consumption of 1060.4 million therms.

SDG&E further projects the total natural gas demand (i.e., retail sales plus gas transported) will decline to 740.4 million therms by the year 2005 (SDG&E, 1997). SANDAG projects a total of 740.1 million therms will be consumed by the residential, commercial, industrial, and public facilities sectors in 2010 (SANDAG, 1994).

2.12.3 Energy—Mexico

The Mexican energy sector is structured differently from that of the United States. The production, distribution, and management of energy supplies in Mexico is under the control of the federal government. The Secretaría de Energía, Minas e Industria Paraestatal (SEMIP) (as of December 1994, called Secretaría de Energía) is the key government ministry responsible for formulating energy policies. The Secretaría de Energía has direct oversight of the Comisión Federal de Electricidad (CFE, the national electric utility), Petróleos Mexicanos (PEMEX, the state-run oil monopoly), the Comisión Nacional Para el Ahorro de Energía (CONAE, the national energy conservation commission), and several energy-related research institutes. Currently, there are no large-scale energy-related activities within the private sector (Sweedler et al, 1995).

Mexico derives most of its energy from oil and natural gas, and its energy resources are not as diverse as those of the United States. In the area of electric generation, there are also significant differences between the United States and Mexico. The United States used domestic coal to generate 55 percent of its electricity in 1993, while in 1990 oil accounted for the major portion of power generation in Mexico, or 54 percent (Sweedler et al, 1995).

Baja California is not connected to the Mexican national electric grid system and does not have a natural gas pipeline system. It depends for its energy supplies on the large geothermal fields at Cerro Prieto, south of Mexicali, and petroleum products imported from distant regions in Mexico. Although not part of the Mexican power grid system, Baja California is connected to the San Diego Gas & Electric Company's system and is part of the North American grid network. The geothermal fields, with a current installed capacity of 620 MW, supply 220 MW to California, mostly to San Diego. These exports represent 29 percent of electricity generation in Baja California and account for 10 percent of SDG&E's supply (Sweedler et al, 1995).

The sources of Baja California's energy in 1991 were: fuel oil (36 percent), leaded gasoline (22 percent), geothermal (13 percent), unleaded gasoline (12 percent), diesel (12 percent), and LPG (5 percent). Baja California has an installed capacity of 1,420 megawatts (MW) consisting of: geothermal (44 percent), fuel-oil based thermal plants (44 percent), and gas turbines that use fuel oil (12 percent). Baseload generation is mostly supplied by the geothermal plants, which account for 71 percent of Baja California's electricity. Peak load generation comes from the fuel oil plants, mostly the large plant near Rosarito, and accounts for 28 percent of electricity generated. Final consumption of energy in Baja California is divided as follows: transportation (54 percent), industrial (28 percent), residential / commercial (15 percent), and agriculture (3.5 percent) (Sweedler et al, 1995).

The primary energy consumption related to the proposed project alternatives is by Pump Station One in Tijuana. Presently, Pump Station One pumps collected wastewater to San Antonio de los Buenos or directs it to the Emergency Connection. Wastewater directed to the United States does not require pumping because it flows by gravity. Pump Station One has four electric pumps with a total of 1,500~~#~~ hp (1,120~~#~~ kW) ~~(electric) pumps~~capable of pumping 15 mgd (667 L/s). Three pumps operate under normal and wet weather conditions.

Chapter 3
Environmental Consequences

This chapter discusses the potential for, and significance of, adverse impacts to U.S. and Mexican environmental resources identified in Chapter 2 that could be associated with implementation of the various treatment alternatives. In the United States, these resources are primarily surface water and marine water quality. In Mexico, the affected environment is primarily marine water quality. Where specific guidance is provided within NEPA or recommendations are provided by the Council on Environmental Quality (CEQ), relative to evaluating a particular impact, such guidance or recommendation is noted. For environmental consequences that do not have specific NEPA guidance regarding impact significance, other rationale for assigning and evaluating relative significance is discussed.

The potential for direct and indirect environmental consequences is also addressed in this chapter, along with proposed measures to mitigate such consequences and the residual significance of such consequences, if any, following implementation of the proposed mitigation measures. Because many of the environmental consequences associated with the various aspects of the SBIWTP have been addressed in previous studies (RECON, 1994; RECON, 1996), these impacts are incorporated herein by reference. Beneficial impacts that would occur as a result of the SBIWTP include ecological, economical, recreational, and public health benefits. Hydrological and oceanographic resources, marine and estuarine biology, and the local economy would also benefit, and the current risk to public health would be reduced. In addition, visual and aesthetic conditions would improve. Only those environmental consequences that differ substantially from the impacts identified in the 1994 Final EIS or those unique to the various alternatives discussed in this document are detailed in this SEIS.

United States and Mexico regulations applicable to the proposed alternatives are in Chapter 5 of this SEIS. Many of these regulations prescribe specific standards used to determine the relative significance of potential environmental effects. Chapter 3 provides a brief summary of relevant regulations; the reader is referred to Chapter 5 for more information about these regulations.

This chapter presents standards of significance for the resource areas and evaluates the impacts, presents mitigation (where applicable), and identifies significance after mitigation for each of the alternatives discussed in Section 1.5 of this SEIS.

3.1 Water Resources

This section presents the potential environmental impacts and proposed mitigation measures for water resources resulting from implementation of the alternatives. Water resources includes surface water, groundwater, and marine water. First, a discussion of the potential hydrologic and water quality impacts to surface water and groundwater resources of the Tijuana River valley is presented. All the proposed alternatives provide a beneficial impact to surface waters in the Tijuana River and the canyon drains because all dry-weather flow will be collected and treated. Similarly, none of the alternatives provides for collection and treatment of all wet-weather flows. Discussion of ground water and surface water is followed by a discussion of the potential effects on marine water quality, including a discussion of marine sediment quality.

3.1.1 Standards of Significance

Impacts to surface and groundwater quality would be considered significant if runoff from the project site would cause an impact to the beneficial uses of the Tijuana River and groundwater basin in the Tijuana River valley identified in the California Regional Water Quality Control Board's (CRWQCB's) Water Quality Control Plan for the San Diego Basin (1955) (Basin Plan). Impacts to marine water quality would be considered significant if the standards for effluent or receiving water set in the existing SBIWTP NPDES permit and the California Ocean Plan, respectively, would be exceeded. For additional information about the regulations and permits that apply to water quality, see Section 5.1.

3.1.2 Surface Water and Groundwater Quality

3.1.2.1 Activated Sludge/No Action

Impacts

Under the Activated Sludge / No Action alternative (No Action alternative), secondary treatment facilities would be constructed at the existing SBIWTP. These additional facilities would consist of six aeration tanks with bubble diffusers and blowers; eight sedimentation tanks with pump facilities, skimming pump station, and electrical control center; two 27-foot-diameter (8.2 m) dissolved air flotation thickeners with chemical addition facilities; one 34-foot-diameter (10.4 m) sludge storage tank; and extension of support facilities such as yard piping. The No Action alternative would treat a constant flow of 25 mgd (1,095 L / s) from Mexico. This alternative would require Mexico to treat all peak flows because this alternative would not have the capability to treat flows over 25 mgd (1,095 L / s). This arrangement would be the opposite of the flow sharing arrangements between Mexico and the United States for the other alternatives considered in this SEIS. For all other alternatives, the first (constant) 25 mgd (1,095 L / s) of flow would be managed by Mexico and the rest of the flow would be handled by the United States up to a peak of 50 mgd (2,190 L / s), as shown in the hydrograph in Figure B1-2 in Appendix B1.

Hydrological impacts associated with construction and operation of the SBIWTP were discussed in detail in the 1994 Final EIS. The south levee of the Tijuana River in the United States has been modified to protect the SBIWTP from floods. For flood protection at the treatment plant site, the SBIWTP has been constructed at an elevation of about 50 feet (15.2 m). The 333-year flood control berms surround the site perimeter. The secondary treatment facilities would be constructed at the SBIWTP site at the same 50-foot (15.2-m) elevation and behind the berm to prevent flood impacts.

Stormwater drainage from treatment process areas within the facility, including the secondary treatment units, would be captured and either routed to the headworks for treatment in the plant, or directed to the river. In the solids handling area, stormwater would be captured and routed to the headworks. In other areas, collected stormwater would pass through silt traps before draining to the river.

While a minor reduction in absorption rates of rainfall would occur due to the minor increase in impervious surface area associated with construction of the secondary treatment facilities, no adverse effects on the groundwater basin capacity, recharge potential, or water quality are anticipated. Thus, no beneficial uses of the Tijuana River valley groundwater basins would be affected.

Dewatering could be required for construction of the activated sludge facilities. Any collected water would be desilted prior to discharge as required to comply with water quality standards. The rate of discharge would be controlled to reduce impacts to any biological resources. Periodic testing of any dewatering effluent would be performed prior to or during construction in compliance with waste discharge requirements that would be set by the CRWQCB. If the quality of dewatering effluent does not meet standards for surface discharge, an alternative would be a temporary discharge through the SBOO when completed.

Any additional required grading would be done consistent with local requirements. No transport of sediment offsite, including into the Tijuana River, estuary, or ocean, would be allowed in accordance with these ordinances.

No surface water quality impacts to the Tijuana River would be expected. During construction, the quality of any stormwater runoff would be managed in accordance with the state construction NPDES permit requirements for stormwater pollution prevention. Also, long-term operation of the SBIWTP and its secondary treatment facilities would be in accordance with the state's industrial NPDES stormwater permit requirements for controlling water quality of storm runoff. This includes implementation of best management practices (BMPs) to minimize potential pollutants draining off the site during storm events as described below. Thus, no impacts to the beneficial uses of the Tijuana River are anticipated.

Mitigation

The impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements including the regulatory oversight of the CRWQCB. Specific measures include:

- Desilt any water collected from dewatering during construction prior to discharge only if necessary.
- Perform periodic testing of dewatering effluent as required for compliance with waste discharge requirements for any required dewatering, prior to and at regular intervals during construction, to ensure that dewatering effluent of degraded quality is not discharged into the Tijuana River, estuary, or surf zone.
- Comply with the California General Permit for Stormwater Discharges Associated with Construction Activities. This includes implementing BMPs to minimize pollutants in stormwater during short-term construction activities. BMPs could include:
  - Grade and excavate to control erosion and sedimentation.
  - Design onsite drainage to prevent transport of sediment offsite.
- Provide redundant process equipment.

- Install a backup power supply and an emergency monitoring alarm system for operations.
- Upon completion of the project features, ensure compliance with the California General Permit for Stormwater Discharges Associated with Industrial Activities. This includes implementing BMPs to minimize pollutants in stormwater runoff during long-term operation of the treatment plant.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.2.2 SBIWTP With Activated Sludge Secondary Treatment

3.1.2.2.1 Activated Sludge With Flow Equalization Basin

Impacts

Under this alternative, flow equalization facilities capable of storing peak flows greater than 25 mgd (1,095 L/s) would be constructed. The proposed new facilities would be the same as those proposed under the No Action alternative with the addition of a 7.0-MG flow equalization basin within the existing plant site footprint. The flow equalization basin would be excavated to a depth of approximately 18 feet (5.5 m) with an impermeable double liner and a concrete liner anchor, an internal access road, and a berm surrounding the basin. An additional pump station would also be constructed to pump flow from the new basin to the activated sludge process.

As with the No Action alternative, excavation for the basin could require groundwater dewatering and disposal of the dewatering effluent. Also, this alternative would have some minor increase in impervious surface area resulting in an insignificant increase in site runoff. Potential impacts to surface water and groundwater would be the same as those discussed under the No Action alternative.

The flow equalization basin would be filled and emptied each day, and would not be used for long-term impoundment of treated effluent. The basin would be lined with a double impermeable membrane to prevent leakage of treated effluent into the groundwater basin.

The basin would be designed with 3 feet (0.9 m) of freeboard and would be surrounded with a concrete liner anchor, berm, and roadway, so that spills could be contained and directed to a collection system. There is little risk of spills during an emergency upset of plant operations.

Mitigation

The impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements including the regulatory oversight of the CRWQCB. Specific measures are the same as those for the No Action alternative.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.2.2.2 Activated Sludge with Expanded Capacity

Impacts

Under this alternative, the secondary treatment facilities would be sized to treat a 50-mgd (2,190 L/s) peak. This would require that 16 secondary sedimentation tanks be constructed instead of the 8 tanks required under the No Action alternative. All other secondary treatment facilities would be the same as the No Action alternative.

Impacts associated with this alternative would generally be the same as those discussed under the No Action alternative. The addition of eight sedimentation tanks represents a minor increase in impervious surface area, and thus a minor increase in runoff that would occur during rain events. Storm drains would be sized to facilitate drainage. Compliance with required construction and industrial NPDES stormwater pollution prevention requirements would ensure water quality control of site runoff during construction and operation. The minor decrease in previous surface area would not significantly affect groundwater basin storage capacity, recharge capacity, or water quality.

Mitigation

The impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements including the regulatory oversight of the CRWQCB. Specific measures are the same as those for the No Action alternative.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.2.3 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.1.2.3.1 Completely Mixed Aerated System (CMA) at Hofer Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the Hofer site adjacent to the existing SBIWTP for treatment of 25-mgd (1,095 L/s) average flow with peaks of 50 mgd (2,190 L/s). Facilities would include six ponds (four with sequential anaerobic and fully mixed cells and two partially mixed), a control facility, distribution structures, and pump stations.

Development of the Hofer site would entail raising the western and southern portions of the site to about 50 feet (15.2 m) in elevation to match the elevation of the existing SBIWTP site. The ponds are designed with 5 feet (1.1 m) of freeboard, which would prevent pond overflow in the event of a storm up to a 333-year storm event**.** In the event of extreme storms, the levee constructed from the SBIWTP to Dairy Mart Road would prevent flooding of the ponds from the river.

Construction of the ponds would require substantial earthwork at the site and dewatering of groundwater during construction. The Hofer property is known to contain some limited areas of soils containing elevated levels of lead or PCBs from prior site uses. The soils are not hazardous but the compounds of concern exceed background levels. These soils would be removed from the site during excavation, treated as necessary, and disposed of offsite. Groundwater quality would be tested prior to dewatering to establish discharge limitations under an NPDES permit that would be issued by the CRWQCB. Dewatered groundwater would be discharged to the Tijuana River if it is of acceptable quality. If not of acceptable quality for surface discharge, the effluent would be conveyed through the SBOO.

Excavation for the ponds and associated facilities could result in potential sediment impacts downstream and to the Tijuana River estuary. Erosion and sedimentation impacts can be controlled through the use of siltation/erosion barriers and sediment catch basins in areas where surface runoff could occur. Water quality of stormwater runoff during construction, as well as long-term operation, would be managed under the NPDES stormwater permit requirements.

All of the ponds would be lined with bentonite to prevent intrusion of wastewater into the groundwater. The system has a redundant design with four first-stage ponds and two second-stage ponds. If leaks were to occur in a pond, repairs would require the shutdown of only the pond in which a leak occurred.

Circulation through the system would not be interrupted if a power failure were to occur because the system flows by gravity; however, recycle pumps, aerators, and electrically operated control features would be affected. This equipment would have an independent backup power feed source in case of power failures.

Mitigation

The impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements including the regulatory oversight of the CRWQCB. Specific measures are the same as for the No Action alternative, with the following additions:

- Install impermeable liners beneath all impoundments and ponds to protect groundwater.
- Grade and excavate with appropriate barriers, fences, and collection systems to control erosion and sedimentation.
- Restore temporary disturbance areas, including the revegetation of graded or exposed areas with native species.
- Install monitoring wells or piezometers to detect leaks if they were to occur.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.2.3.2 Advanced Integrated Pond System (AIPS) at Spooner's Mesa

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the currently undeveloped Spooner's Mesa site to treat 25-mgd (1,095 L/s) average flow and peaks of 50 mgd (2,190 L/s). The facilities would also require the grading of an improved access road from Smuggler Gulch along the eastern slope of Spooner's Mesa; a primary effluent conveyance line, pump station and return line from the SBIWTP along the eastern face of the mesa; and two additional conveyance lines on the north slope of the mesa to connect to the SBOO. Excavation for the ponds and associated facilities could result in erosion and sedimentation impacts in Goat Canyon, Smuggler Gulch, and downstream to the Tijuana River estuary. Erosion and sediment impacts, however, would be controlled through the use of siltation/erosion barriers and sediment catch basins in areas where surface runoff could occur. The additional access road would require runoff and erosion controls. Water quality of stormwater runoff during construction would be managed under the NPDES construction stormwater permit requirements.

Pond development on Spooner's Mesa would require converting 78 acres (31.6 ha) of currently permeable surface area to bentonite-lined ponds. Bentonite is used to prevent seepage. Seepage to groundwater would not be expected from the lined ponds. Construction of the ponds would require substantial earthwork at the site, but probably would not require dewatering of groundwater during construction because of the elevation of the site. Some of the area would remain unpaved for maintenance vehicles.

The system has a redundant design with three ponds for each stage of treatment. If leaks were to occur in a pond, repair would not require the shutdown of more than one pond.

Ponds would be designed to contain 3 feet (91 cm) of freeboard, which would adequately prevent overflows during storm events. Additionally, the earthen berms that contain the ponds would be designed with excess capacity to contain extreme rain events. Circulation through the primary system would not be interrupted if a power failure were to occur although the primary effluent could not be delivered to Spooner's Mesa.

Mitigation

The potential impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements including the regulatory oversight of the CRWQCB. A summary of mitigation measures incorporated into the project design that would reduce significant impacts to below a level of significance includes the following:

- Grade and excavate with appropriate barriers, fences, and collection systems to control erosion and sediment.
- Desilt any water collected from dewatering prior to discharge, if necessary.
- Provide and maintain surface runoff control features to minimize erosion and sediment.
- Restore temporary disturbance areas, including the revegetation of graded or exposed areas with native species.
- Install impermeable liners in all impoundments.

- Provide redundant process equipment
- Install a backup power supply and an emergency monitoring alarm system.
- Install protective works such as energy dissipaters in the runoff collection and discharge system to prevent scour and downstream siltation in the natural drainage.
- Comply with the California General Permit for Stormwater Discharges Associated with Construction Activities. This includes implementing BMPs to minimize pollutants in stormwater during short-term construction activities.
- Comply with the California General Permit for Stormwater Discharges Associated with Industrial Activities. This includes implementing BMPs to minimize pollutants in stormwater during long-term operation of the project.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.2.4 Less Than Full Secondary Effluent

3.1.2.4.1 Advanced Primary Only

Impacts

The existing SBIWTP would be operated as it is under current conditions (i.e., using primary treatment only) with ultimate discharge to the SBOO. No secondary treatment facilities or equalization of flow would be required under this alternative.

This alternative represents a reduction in site development requirements compared to the other alternatives. No substantial difference in the amount and quality of runoff would occur. No agency permits would be required for construction, and no new impacts on inland surface water or groundwater quality would result.

Mitigation

No mitigation measures are required because no changes to existing conditions would occur under this alternative.

Significance After Mitigation

No new surface and groundwater water quality impacts would occur under this alternative.

3.1.2.4.2 SBIWTP with Partial Secondary Treatment

Impacts

This alternative is similar to the No Action alternative, except that flows greater than 25 mgd (1,095 L/s) and up to 50 mgd (2,190 L/s) would receive advanced primary treatment only. Flows over 25 mgd (1,095 L/s) would subsequently be bypassed around the secondary process to the SBOO. The proposed additional facilities for secondary treatment are the same as those described in the No Action alternative.

Effects on surface and groundwater resources would be similar to those of the No Action alternative. No adverse hydrologic resources would be expected.

Mitigation

The impacts to surface and groundwater hydrology would be avoided or mitigated to a level below significance by features of project design, applicable ordinances, and statutory requirements, including the regulatory oversight of the CRWQCB. Specific measures are the same as for the No Action alternative.

Significance After Mitigation

Incorporation of project design features and adherence to required agency permits would ensure no significant hydrologic and water quality impacts to surface water and groundwater resources in the Tijuana River valley.

3.1.3 Marine Water Quality

3.1.3.1 Ocean Model

Water quality parameters were analyzed in an ocean modeling evaluation to determine compliance with the Ocean Plan standards (see Appendix C). The ocean model prepared for this SEIS was an extension of the 1996 ocean model conducted by Parsons Engineering, Inc. (1996) for the Interim Operation SEIS. The 1996 ocean model predicted impacts from discharges to the surf zone at San Antonio de los Buenos in Mexico and advanced primary effluent discharged through the SBOO. The 1997 ocean model used the revised flows and effluent concentrations for each of the alternatives considered in this SEIS and predicted impacts by discharges through the SBOO. The modeling was limited to the same water quality parameters used in 1996, except that additional modeling for fecal coliform was added. The parameters investigated in the current ocean model were total and fecal coliform, dissolved oxygen, pH, sedimentation, turbidity, and Table B compounds. The ocean model evaluated alternatives and compared them to Ocean Plan standards. This evaluation is the basis for the impacts described in Sections 3.1.3.2 through 3.1.3.5.

The NPDES permit requirements for coliform monitoring were considered when modeling total and fecal coliform levels at modeling stations. Total and fecal coliform levels were modeled at many modeling stations distributed in the region (see Figure 6.1 in Appendix C). For nearly all stations, including stations within the coastal zone, total and fecal coliform levels from all alternatives would comply with the Ocean Plan standards. Preliminary modeling indicated no impacts from any alternatives at most modeling stations; therefore, only the nearest stations, which are located in kelp beds, were the focus of the evaluation because it is at these stations that impacts, if any, occur,. Stations were selected on the basis of the potential for impacts.

U.S. monitoring stations I39, I25, and I26 specified in the NPDES permit were the focus of the modeling effort because of the proximity of these monitoring stations to preselected modeling stations. Both monitoring and modeling stations are located in the nearest U.S. kelp bed where monitoring would be conducted at least five times per month in accordance with permit requirements; therefore, it was possible to develop predictions of coliform levels at these stations within the context of the monitoring requirements.

3.1.3.2 No Action

The No Action alternative uses advanced primary treatment followed by activated sludge secondary treatment. The flow through both primary and secondary treatment would be assumed constant at 25 mgd (1,095 L/s). All dry weather flows of Tijuana wastewater in excess of 25 mgd (1,095 L/s) would be processed at Pump Station One and transported to San Antonio de los Buenos in Mexico for discharge, with or without treatment. No dry weather sewage flows are anticipated to enter the Tijuana River.

Impacts

Modeling of surf discharges in Mexico was performed by Parsons Engineering Science, Inc. (1996) to determine the dispersion and dilution of pollutants discharged at San Antonio de los Buenos. Impacts to the United States by this surf discharge were assessed in the Interim Operation SEIS. It was found that discharge of both treated and untreated wastewater at the shoreline in Mexico was expected to result in coliform levels that would exceed the Ocean Plan standards in United States waters from the international border up to the mouth of the Tijuana River. This discharge would continue to significantly impact local beaches in that area of the United States. Of the potential pollutants detected during raw wastewater testing, only polynuclear aromatic hydrocarbons (PAHs) were expected to reach United States ocean waters in concentrations exceeding Ocean Plan standards. Such exceedances would be a significant impact.

The effluent from the No Action alternative was used in the ocean model for evaluation of the water quality parameters. The model projected that average total coliform levels following initial dilution within the zone of initial dilution (ZID) would be significantly reduced. By the time the effluent travels to the kelp beds and coastal zone where these limits are actually applied, the dilution and bacterial die off are expected to be reduced to concentrations well below Ocean Plan limits.

The No Action alternative is predicted to be in compliance with the Ocean Plan limits for total coliform at all times. For fecal coliform, the predicted percent chance of noncompliance ranges from zero to 0.22 percent during the months of October and November at monitoring station I39. This probability is very low and exists only at water depths from 32.8 feet (10 m) below the surface down to the ocean floor. There is also a possibility that coliform levels could increase in the SBOO because of the length of time for the effluent to flow from the SBIWTP to the SBOO. If an exceedance were to occur at the kelp bed, it would be a significant adverse impact if divers were present. Although significant, the model indicates low probability and short duration of the occurrences. In the event of coliform exceedances attributed to the SBIWTP, disinfection by chlorination/dechlorination would occur. There could be potential impacts to aquatic life with the use of chlorination The impacts, however, are infrequent, short-term, and not expected to be significant, because chlorination would be followed by dechlorination and performed on an emergency basis only.

The Ocean Plan requires that the discharge not lower the dissolved oxygen in the receiving water by more than 10 percent of the ambient value. The ocean modeling evaluated the No Action alternative's effect on dissolved oxygen demand assuming that the alternative would meet the NPDES permit limit for 25 mg/L of CBOD. The ocean model evaluated the change in dissolved oxygen under worst-case conditions where the effluent would be void of dissolved oxygen. The immediate reduction of the ambient dissolved oxygen was less than 1 percent. Several additional factors that could cause increased oxygen demand (and subsequent oxygen depletion) were evaluated. These factors were decaying sediments on the ocean floor, increased oxygen demand by the organic matter in the effluent, resuspension of settled solids within the area of the effluent plume, and temperature. When these conditions were combined in various scenarios in the ocean model, the estimated change in dissolved oxygen was found to be reduced by less than 10 percent for the No Action alternative (see Appendix C). The impact from these reductions in dissolved oxygen is considered insignificant.

Because the pH of the receiving water would be altered less than 0.2 units, the effluent would meet the NPDES permit limit.

The suspended solids concentration in the effluent is limited in the NPDES permit to 30 mg/L. Given this condition, the No Action alternative would affect the ambient suspended solids level of the ocean by increasing the concentration between 10 percent to 15 percent. This increase would occur at the end of initial dilution as a worst-case scenario with decreasing impact away from the ZID. The impact would occur at depths greater than 32.8 feet (10 meters) where discoloration would not be visible. Light attenuation in the ocean naturally occurs at shallower depths and, therefore, would not be affected by added suspended solids that would exist at deeper depths. The impact would be insignificant.

Table B compound concentrations were calculated based on raw wastewater concentrations that were compiled from samples collected in 1995 and 1996 in the Emergency Connection (see Tables 6.12A - 6.15 of Appendix C). Several compounds that are listed in Table B for protection of human health or marine life were not detected during sampling of the raw wastewater and, therefore, their impact is considered insignificant because there is no basis to suspect their presence. In accordance with the permit, monitoring would continue for Table B compounds to further assess their presence. For average and maximum concentrations of detected compounds in the raw wastewater, effluent concentrations were estimated for the No Action alternative and compared to the Ocean Plan limits. In the case of polynuclear aromatic hydrocarbons (PAHs), which is a group of compounds, the Ocean Plan defines PAHs as the sum of the individual species. Most of the individual species were not detected in the sampling. In 64 samples there was one detection of anthracene and two detections each of fluoranthene and phenanthrene. When summing the results, the detection limit was used as if it were an actual detection for the nondetected compounds in order to comply with the Ocean Plan definition for PAHs. This produced an artificially high concentration, which suggests apparent noncompliance. When only anthracene, fluoranthene, and phenanthrene are summed, the discharge limits are met. This methodology for determining the PAHs effluent concentration was also used for total DDT, another group compound. Like PAHs, total DDT appears to be in noncompliance but summation of only the detected individual compounds does not exceed the discharge limits. The concentrations of these compounds, therefore, are considered insignificant. No other compounds were found to exceed the discharge limits.

Although Tijuana is currently developing a pretreatment program, it is feasible that unusually high concentrations of toxic compounds (toxic spikes) could enter the treatment plant on occasion. Toxic spikes can be reduced to varying extents, more so by secondary treatment than by primary treatment only. Toxic spikes can cause higher effluent concentrations of the given compounds and possibly upset the biological treatment process. A treatability study conducted on raw wastewater collected from Pump Station One found that some inhibition of carbonaceous and/or nitrogenous BOD removal was present in at least one of the three samples tested (Malcolm Pirnie, Inc., 1992). This finding suggests that toxic compounds could be present at times and at levels that will inhibit treatment. The findings also indicate that toxic compounds could be present at levels that could upset the biological process. Toxic upsets can affect the treatment process for days or sometimes weeks before the treatment plant resumes normal removal efficiency. Toxic spikes are normally short in duration and can extend a few hours before concentrations lower to typical levels. It is possible that a toxic spike could cause exceedance of the toxicity standard and an instantaneous maximum limit in addition to increasing the effluent BOD. Based on existing data, the occurrence of toxic upsets is not expected to be frequent, so the impact is anticipated to be less than significant.

Although effluent BOD is not limited by the Ocean Plan, a limit exists for dissolved oxygen depletion of the receiving water. It is feasible that plant upsets would increase the effluent BOD, thereby reducing dissolved oxygen levels; this is not likely to occur at levels that would exceed the receiving water limit of 10 percent reduction. The impact would be insignificant.

Mitigation

In the event that coliform levels exceed receiving water limits, the City and County of San Diego Department of Environmental Health, Cities of Imperial Beach and Coronado, CRWQCB, and Office of Emergency Services would be notified immediately. Notification would be performed regardless of whether the exceedance was a result of near-shore impacts by discharges from San Antonio del los Buenos (or other sources), or in the kelp bed from the SBIWTP. Although coliform exceedances from the SBIWTP are not expected to occur, an emergency disinfection plan would be prepared and implemented. An emergency disinfection plan to deal with infrequent coliform exceedances would include the following elements:

- Immediately notify parties identified in the NPDES permit (those listed above).
- Chlorinate and dechlorinate using planned and/or existing facilities. These facilities would be used on an interim basis only to limit the potential effects of chlorination on marine life. Chlorination would be immediately followed by dechlorination to remove free chlorine from the effluent and to protect marine life (see Appendix B4). A sample of the effluent would be collected following dechlorination and tested for chlorine residual and total chlorine compounds. Once initiated, the duration of disinfection would be determined by the CRWQCB and the County of San Diego Department of Health Services.
- Perform additional monitoring as required by the NPDES permit.
- Analyze the distribution of coliform in the water to determine its source.

Significance After Mitigation

Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant. The impact by coliform exceedance through the SBOO would be mitigated by disinfection to a level that is insignificant .

3.1.3.3 SBIWTP with Activated Sludge Secondary Treatment

Similar to the No Action alternative , the Activated Sludge with Flow Equalization Basin and the Activated Sludge with Expanded Capacity alternatives incorporate activated sludge secondary treatment into the treatment process,. The main difference between the No Action alternative and these alternatives discussed below is that the flow coming from Mexico would not be a uniform flow rate of 25 mgd (1,095 L/s). Because the flow would not be equalized by Mexico, the flow coming in to the SBIWTP would fluctuate on a daily and seasonal basis. Low flows would decrease to about 3.5 mgd (153 L/s) at night and peak flows would reach 50 mgd (2,190 L/s). Night flows are directed from Pump Station One on an intermittent basis so that flows to the SBIWTP are 10 mgd. Flows at night are expected to increase and produce a continuous flow to the SBIWTP and San Antonio de los Buenos plants. With these alternatives, flows to San Antonio de los Buenos would be greatly reduced, at least for the short term. Long-term reduction would be influenced by the population growth rate in Tijuana and Tijuana's ability to accommodate increased wastewater flows.

3.1.3.3.1 Activated Sludge with Flow Equalization Basin

In this alternative, a flow equalization basin would be constructed following the primary treatment process. Primary effluent would flow into the basin with the same variability as it flows into the influent of the treatment plant. The basin would store flows and regulate the effluent flow rate, thereby producing a uniform flow of 25 mgd (1,095 L/s) into the secondary treatment process.

Impacts

Under this alternative, wastewater volumes discharged to the surf in Mexico would be the same as the No Action alternative. The probability for exceedances of coliform standards from SBIWTP discharges would be the same as for the No Action alternative and is considered less than significant. In the event of coliform exceedances attributed to the SBIWTP, disinfection by chlorination/dechlorination could occur. There could be impacts to aquatic life with the use of chlorination; however, the impacts are infrequent, short-term, and not expected to be significant because the use of disinfection would be conducted only on an emergency basis. As with the No Action alternative, dissolved oxygen, pH levels, and suspended solids are predicted to meet the NPDES permit limits. Similarly, Table B compounds are predicted to meet the discharge limits or are not detected. In both cases, the impact is considered insignificant. As discussed for the No Action alternative, toxic spikes could occur but are considered less than significant.

Mitigation

The mitigation measures specified for the No Action alternative would be implemented under this alternative.

Significance After Mitigation

Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant. The impact by coliform exceedance through the SBOO would be mitigated by disinfection to a level that is insignificant.

3.1.3.3.2 Activated Sludge with Expanded Capacity

In this alternative, an activated sludge secondary treatment facility would be constructed to accept all flows up to 50 mgd (2,190 L/s). To do so, the activated sludge facility would have eight additional secondary clarifiers (settling tanks) to handle flow fluctuations and achieve treatment to secondary standards.

Impacts

Under this alternative, wastewater volumes to the surf in Mexico would be the same as the No Action alternative. The probability for coliform exceedances from SBIWTP discharges would be the same as the No Action alternative. Under average flow conditions, this alternative presents the same predicted percent chance of noncompliance with standards for fecal coliform. In the event of coliform exceedances attributed to the SBIWTP, disinfection by chlorination/dechlorination could occur. There could be impacts to aquatic life with the use of chlorination; however, the impacts are infrequent, short-term, and not expected to be significant because the use of disinfection would be conducted only on an emergency basis.

Under peak conditions, the percentage increases to 0.84 percent. During average and peak conditions, the frequency of potential exceedance is the same as for the No Action alternative, and the depth of the potential exceedances is the same(i.e., from 32.8 feet (10 m) deep to the ocean bottom). The highest probability exists in October at depths from 32.8 feet (10 m) to 49.2 feet (15 m). As with the No Action alternative, dissolved oxygen, pH levels, suspended solids, and Table B compounds would be predicted to meet the NPDES permit limits. As discussed for the No Action alternative, toxic spikes could occur but are considered less than significant.

Mitigation

The mitigation measures specified in Section 3.1.2.2 for the No Action alternative would be implemented under this alternative.

Significance After Mitigation

Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant. The impact by coliform exceedance through the SBOO would be mitigated to a level that is insignificant.

3.1.3.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

The following two alternatives (Completely Mixed Aerated System at Hofer Site and Advanced Integrated Pond System at Spooner's Mesa) are pond systems, one that would provide secondary treatment and one that would provide "secondary-equivalent" treatment of the wastewater. Secondary-equivalent treatment refers to the level of treatment that is obtained by pond systems in accordance with the Clean Water Act where BOD and TSS levels from wastes are reduced to levels comparable by activated sludge systems. The effluent BOD and TSS from the secondary equivalent treatment are higher than for activated sludge because the effluent from the former contains algae, which inflates both BOD and TSS. In effect, the ability to remove wastes is equivalent to secondary treatment by activated sludge but the final effluent has higher concentrations of BOD and TSS. The increases in these parameters represent algae, not wastes.

Both alternatives would receive primary effluent at an average flow of 25 mgd (1,095 L/s) and a peak flow of 50 mgd (2,190 L/s).

3.1.3.4.1 Completely Mixed Aerated System at Hofer Site

In this alternative, a modified completely mixed aerated pond system would consist of four ponds with ADPs and completely mixed aerated cells followed by two partially mixed aerated ponds (see Appendix B5). The CMA at Hofer alternative would treat the primary effluent to secondary levels (i.e., the effluent BOD and TSS would be less than 30 mg/L each). The effluent would meet the discharge conditions described in the NPDES permit (Section B.2.a of the NPDES permit).

Impacts

Under this alternative, wastewater volumes to the surf in Mexico would be the same as the No Action alternative. Coliform levels discharged through the SBOO would be lower than for the No Action and activated sludge alternatives. The probability of exceeding standards for total or fecal coliform is zero, as predicted by the ocean model; therefore, there would be no impacts from total or fecal coliform levels. The CMA system at the Hofer site would be better able to manage toxic spikes without reduced treatment or upset than the No Action alternative or any other alternative except the AIPS at Spooner's Mesa alternative.

As with the No Action alternative, dissolved oxygen, pH levels, suspended solids, and Table B compounds would be predicted to meet the NPDES permit limits.

Mitigation

No mitigation measures are necessary for discharge through the SBOO.

Significance After Mitigation

Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant.

3.1.3.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

This alternative uses the advanced integrated pond system technology and would handle average flows of 25 mgd (1,095 L/s) and peak flows of 50 mgd (2,190 L/s). The alternative would achieve preliminary secondary-equivalent treatment for BOD and TSS (i.e., the effluent BOD and TSS would be below the secondary-equivalent standards of 45 mg/L BOD and 95 mg/L TSS). The difference between preliminary secondary-equivalent standards and secondary standards (30 mg/L BOD and 30 mg/L TSS) reflects the quantity of algae produced in the system and present in the discharge. The concentrations do not represent untreated waste matter.

Impacts

Under this alternative, wastewater volumes to the surf in Mexico would be the same as the No Action alternative. No exceedances of total or fecal coliform limits are projected for this alternative because the long hydraulic retention time in the system produces adequate natural disinfection. The effluent would already meet the receiving water limits immediately following initial dilution.

Dissolved oxygen reductions would be greater than the No Action alternative due to the algae present in the effluent; however, the Ocean Plan standards would still be met.

The pH of the system would normally fall within the permit limits of 6.0 to 9.0. The suspended solids in the effluent would be higher as a result of the algae. The suspended solids would range from about 30 mg/L to 65 mg/L depending upon the season. This increase, however, is negligible and the impact insignificant.

The concentrations of Table B compounds in the effluent would be the lowest from this alternative. The AIPS at Spooner's Mesa alternative would be better able to manage toxic spikes without reduced treatment or upset than the No Action alternative. Because of its large dilution capacity and the anaerobic digester pits, this alternative is best suited to treat toxic loads.

Mitigation

No mitigation measures are necessary for discharge through the SBOO.

Significance After Mitigation

Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant.

3.1.3.5 SBIWTP with Less than Full Secondary Effluent

The following two alternatives (Advanced Primary Only and Partial Secondary Treatment) do not produce an effluent that meets the waste discharge requirements of Section B.2.a of the NPDES permit with respect to CBOD and TSS, either part or all of the time. Both alternatives use advanced primary treatment and can accommodate average flows of 25 mgd (1,095 L/s) and peak flows of 50 mgd (2,190 L/s). The following analysis of impacts assumes that the current NPDES permit conditions apply. These conditions could change if the USIBWC is granted a waiver of the Clean Water Act 301(h) requirement for secondary treatment. The application process for a 301(h) waiver would include a minimum of 1 year of data gathering and 2 years of data analysis and approval. Compliance with the Ocean Plan would still be required during that time.

3.1.3.5.1 Advanced Primary Only

In this alternative, wastewater flows receive advanced primary treatment only. Treatment involves chemical and physical removal of particles, but secondary biological treatment is not provided.

Impacts

Under this alternative, wastewater volumes to the surf in Mexico for discharge at San Antonio de los Buenos would remain the same as in the No Action alternative. For total coliform, probabilities of exceeding standards exist in kelp beds at monitoring stations I39 and I26 (see Appendix C, Figure 2.5). At I39, the predicted percentages for a noncompliance event range from 0.01 percent to 7.66 percent. Predicted chances for noncompliance span 6 months (January, February, May, October, November, and December) and mostly occur at depths below 32.8 feet (10 meters). A very low chance of noncompliance (0.05 percent) exists in depths up to 16.4 feet (5 meters) below the surface. In December, this chance of noncompliance (0.05 percent) exists up to the surface (0-foot depth). At I26, the predicted chance is only 0.01 percent for 2 months (May and November) at depths below 16.4 feet (5 meters).

For fecal coliform, the predicted probability for noncompliance ranges from 0.01 percent to 15.92 percent at monitoring station I39. The probability exists for 9 months (all months except June, July, and August). The numerically highest probabilities exist in October and November. Probabilities exist from the surface on down in the months of January, February, November, and December. Probabilities at surface depths of 0 to 16.4 feet (0 to 5 meters) are low and range from 0.02 percent to 0.9 percent. At station I26, a very low probability for noncompliance exists in January (0.02 percent), February (0.02 percent), October

(0.01 percent), and November (0.01 percent) at depths from 16.4 feet (5 meters) to the ocean bottom.

Given the frequency of chance for noncompliance for both total and fecal coliform at monitoring station I39, the impact is considered significant.

In the event of coliform exceedances attributed to the treatment plant, disinfection by chlorination/dechlorination could occur. There could be potential impacts to aquatic life with the use of chlorination; however, the impacts are infrequent, short-term, and not expected to be significant, because the use of disinfection would be conducted only on an emergency basis.

The reduction in dissolved oxygen in the receiving water is highest for this alternative because the effluent BOD would be 204 mg/L under average influent BOD conditions and 295 mg/L under maximum influent BOD conditions. Even at this discharge level, however, the dissolved oxygen reduction is well below the 10 percent reduction limit for dissolved oxygen.

Changes to the pH would not exceed the NPDES permit limit.

The average suspended solids concentration in the effluent is 88 mg/L and the maximum concentration is projected to be 203 mg/L. This discharge would continuously exceed the permitted discharge limit of 25 mg/L (30-day average). Given these conditions, the advanced primary alternative would affect the ambient suspended solids level of the ocean by increasing the concentration up to 57 percent. This increase would occur at the end of initial dilution with the largest percent increase representing maximum effluent concentration conditions. Because the effluent would disperse and migrate at lower depths, the added solids load is not expected to cause discoloration of the surface or significant attenuation of light; therefore, impacts to water quality are not considered significant.

For average and maximum concentrations in the raw wastewater, effluent concentrations of Table B compounds were estimated for the Advanced Primary alternative and compared to the Ocean Plan limits. For all compounds detected, only copper and total DDT appear to exceed Ocean Plan limits. The average copper concentration of 3.2 µg/L would exceed the average discharge limit set for protection of marine life (3 µg/L). For total DDT, the average concentration of 0.00091 µg/L would exceed the Ocean Plan limit for protection of human health from noncarcinogens and carcinogens (0.00017 µg/L). The toxicity standard could also be exceeded as a result of the copper or because of the generally lower treatment capacity of the advanced primary alternative compared to the No Action alternative, particularly for treating toxic spikes.

Mitigation

To address coliform exceedances, notification and sign posting would occur as specified by the NPDES permit and described above. An emergency disinfection plan would be prepared and implemented. The plan would include those same elements described as mitigations under the No Action alternative.

Exceedances of copper and total DDT, and potential exceedance of toxicity could be addressed by continued development of a pretreatment program in Mexico. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Impacts that were identified as potentially significant are summarized here assuming the above mitigations would occur:

- Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant.
- Emergency disinfection would minimize the duration of coliform levels above Ocean Plan limits. As modeled, although disinfection would mitigate the duration of the impact by coliform noncompliance, there is a high frequency for potential noncompliance that is not mitigatable. The impact is considered significant.
- Toxic spikes could cause exceedances of the toxicity limit which would be significant.
- Based on the 1997 ocean modeling results, copper and total DDT exceedances could occur. Thus, the impacts would remain significant until a pretreatment program in Mexico effectively reduces these compounds.

3.1.3.5.2 Partial Secondary Treatment

In this alternative, the flows to the plant are 25 mgd (1,095 L/s) average flow and 50 mgd (2,190 L/s) peak flow. All of the flow would receive primary treatment. The activated sludge secondary treatment, however, would not be sized to handle flows above 25 mgd (1,095 L/s). Therefore, the peak flow receiving secondary treatment would be 25 mgd (1,095 L/s). Flow rates handled by the activated sludge process would range from about 3.5 mgd (131 L/s) up to 25 mgd (1,095 L/s), producing an average flow of 18 mgd (788 L/s). Flows at night are expected to increase and produce a continuous flow to the SBIWTP and San Antonio de los Buenos plants. Effluent from the plant would be a blend of primary and secondary effluent.

Impacts

This alternative would reduce the volumes in Mexico to San Antonio de los Buenos for surf discharge and would, therefore, be the same as the No Action alternative. The potential for noncompliance with total coliform standards is similar to the Advanced Primary alternative, although not quite as frequent and the predicted percent chance of noncompliance is somewhat lower. For total coliform, noncompliance is predicted at monitoring station I39 for 4 months (February, October, November, and December). The percent chance of noncompliance's ranges from 0.01 percent to 4.43 percent with the highest percentage in November from depths of 32.8 feet to 49.2 feet (10 to 15 meters). No exceedances are predicted for monitoring station I26 or other stations. (See Appendix C, Figure 2.5.)

For fecal coliform, a chance of noncompliance exists in all months except March, June, July, and August. The percent chance of noncompliance ranges from 0.01 percent to 10.15 percent. The largest percentage occurs in October under peak flow conditions at depths from 32.8 feet to 49.2 feet (10 to 15 m). The percent chance for noncompliance extends up to the surface (zero-foot depth) in January, February, November, and December, although these percentages are very low (0.01 percent to 0.23 percent). Given the frequency of predicted percentage chance of noncompliance, the impact is considered significant.

In the event of coliform exceedances attributed to the treatment plant, disinfection by chlorination/dechlorination may occur. There could be potential impacts to aquatic life with the use of chlorination; however, the impacts would be infrequent, short-term, and are not expected to be significant because the use of disinfection would be conducted only on an emergency basis.

The reduction in dissolved oxygen in the receiving waters by this alternative is the second highest of all the alternatives, yet is well below the dissolved oxygen reduction limit (10 percent) specified in the NPDES permit. The impact resulting from a change in pH is insignificant and within the NPDES permit limits.

The average suspended solids concentration in the effluent is 40 mg/L under average flows and 54 mg/L under peak flows when the influent TSS is at the average concentration of 350 mg/L. For a maximum influent TSS of 810 mg/L, the effluent TSS is 92 mg/L during average flows and 126 mg/L during peak flows. These levels exceed the waste discharge requirements of the NPDES permit. Given these conditions, the partial primary alternative would affect the ambient suspended solids level of the ocean by increasing the concentration up to 35 percent. This increase would occur at the end of initial dilution with the largest percent increase representing maximum effluent concentration conditions. Because the effluent would dispense and migrate at lower depths, the added solids load is not expected to cause discoloration of the surface or significant attenuation of light. This is not considered a significant impact.

For average and maximum concentrations in the raw wastewater, effluent concentrations of Table B compounds were estimated for the Partial Secondary alternative and compared to the Ocean Plan limits. For all compounds detected, only total DDT is predicted to exceed Ocean Plan limits. The total DDT concentration of 0.00060 μg/L would exceed the average discharge limit set for protection of human health (0.00017 μg/L). The toxicity standard could also be exceeded as a result of the generally lower treatment capacity of the partial secondary alternative compared to the No Action alternative, particularly with regard to toxic spikes.

Mitigation

To address exceedances of coliform standards, notification and sign posting would occur as specified by the NPDES permit and described above. An emergency disinfection plan would be prepared and implemented. The plan would include those same elements described as mitigations under the No Action alternative. Exceedances of DDT and toxicity could be addressed by continued development of a pretreatment program in Mexico. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Impacts that were identified as having significance are summarized here, assuming the above mitigations would occur:

- Impacts by discharges at San Antonio de los Buenos could not be mitigated and would remain significant.
- Emergency disinfection would minimize the duration of coliform levels above the limits. Although the impact by coliform noncompliance would be shortened in duration by these measures, the potential for frequent coliform noncompliance indicates a significant impact, as modeled.

- Based on the 1997 ocean modeling results, the average total DDT concentration could exceed the effluent limit. Thus, the impact would remain significant until a pretreatment program in Mexico effectively reduces this compound.
- Toxic spikes could cause exceedances of the toxicity limit which would be significant.

3.1.4 Marine Water Quality Impacts—Mexico

The impacts to Mexican marine water quality were evaluated for all the alternatives. Because surface water and groundwater are upgradient from the SBIWTP and would not be affected by implementation of the alternatives, they are not evaluated in this SEIS.. With regard to marine water quality, all of the alternatives offer substantial benefits to Mexico by diverting and treating wastewater that would otherwise be discharged to the surf, with or without treatment, near San Antonio de los Buenos,. With any of the alternatives, at least 25 mgd of wastewater can be diverted, thereby improving near-shore marine water quality.

For all of the alternatives, the same water quality parameters were evaluated in the ocean model (see Appendix C) for the United States and Mexico. These parameters were evaluated for impacts in the United States according to U.S. federal- and state-determined standards. Mexican standard NOM-001-ECOL-1996 has limits for discharges to coastal waters (see Chapter 5). Although these standards may not apply exactly to a discharge of treated Mexican wastewater that enters Mexican marine water via an ocean outfall and is transported by ocean currents, this NOM is used as the most appropriate standard. The NOM provides standards for many of the same compounds that have standards in the California Ocean Plan and NPDES permit. Therefore, the ocean modeling conducted to determine compliance with the U.S. standards was also used to determine compliance with this Mexican NOM. See Appendix C for a complete discussion of the parameters that were evaluated. Discussion here is limited to fecal coliform, dissolved oxygen, pH, total suspended solids, and heavy metals. Other parameters are not discussed because they would not be discharged at concentrations that would exceed the limits provided by the norm for coastal waters (NOM-001-ECOL-1996) or a Mexican standard has not been established for them.

To determine coliform levels in Mexican marine waters, two modeling stations were examined, both located at the 30-foot contour. Station D4 was located about one-half mile north of the United States-Mexico boundary, and Station D3 was located about 1.3 nautical miles south of the boundary. It appears that D3 might be located in a kelp bed, where divers could presumably be present. Kelp beds are located in Mexican marine waters at the same depths as found in U.S. marine waters. Three kelp beds are commercially harvested near the border at Playa de Tijuana, Islas del Coronado, and Punta Mesquite near Rosarita. Other kelp beds are located farther south at Punta Salsi puedes, San Miguel, el Sauzal, Isla de Todos los Santos, and Punta Bauda.

The long-term average fecal coliform concentration at modeling station D3 was predicted to exceed 400/100 mL less than 1 percent of the time in December for the Advanced Primary Only alternative and less than 1 percent of the time in February for the Advanced Primary Only and Partial Secondary Treatment alternatives at Station D4. Because the Mexican standard is 2,000/100 mL for monthly average fecal coliform, this limit likely would be met virtually all of the time. In addition to the long-term average, short-term simulated monitoring for fecal coliform was developed based on the monitoring frequency and procedures specified in the NPDES permit. Using these monitoring conditions, the discharge is not predicted to exceed any of the NPDES limits. Because these limits include limits that are more stringent than the Mexican limits, the Mexican standards would also be met.

For dissolved oxygen, pH, and suspended solids, effluent from all alternatives would meet Ocean Plan standards in United States marine water and subsequently be highly diluted by sea water by the time the effluent crosses the United States-Mexico boundary in the ocean. The effluent would also meet the standards presented in NOM-001-ECOL-1996, which are generally higher (i.e., less stringent) than the Ocean Plan standards. This is also the case for all heavy metals, including copper. Therefore, the impact to Mexican marine waters is insignificant, and no mitigation is necessary.

3.2 Biological Resources

Biological resources refers to terrestrial resources and marine resources. Standards of significance for both of these resources are discussed in Section 3.2.1. Terrestrial resources are examined in Section 3.2.2 and marine biological resources in Section 3.2.3.

3.2.1 Standards of Significance

Impacts to biological resources would be considered significant if an action would adversely affect a species, its stock, or its habitat, if the species is protected by the Endangered Species Act, the Marine Mammal Protection Act, the Migratory Bird Treaty Act, the California Endangered Species Act, or the California Ocean Plan. For additional information about the laws, regulations, and permits that apply to biological resources, see Section 5.1.

An Ecological Risk Assessment (ERA) was conducted to assess relative impacts by the alternatives on marine benthic organisms and fish (see Appendix D). The standard of significance used to assess the relative significance of the alternatives was whether there would be detrimental toxic effects to exposed receptors outside the zone of initial dilution.

3.2.2 Terrestrial Biological Resources

3.2.2.1 No Action

Impacts

Under this alternative, impacts were identified and addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b) for terrestrial biological resources. Those impacts are incorporated herein by reference. The reader is directed to the 1994 Final EIS and the Interim Operation SEIS for discussion of environmental consequences. No new impacts have been identified.

Mitigation

No mitigations are necessary in addition to those identified in the 1994 Final EIS.

Significance After Mitigation

The impact to terrestrial biological resources is insignificant.

3.2.3 SBIWTP with Activated Sludge Secondary Treatment

3.2.3.1 Activated Sludge with Flow Equalization Basin

Under this alternative, impacts were identified and addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b) for terrestrial biological resources. The reader is directed to these documents for discussion of environmental consequences. No new impacts have been identified.

3.2.3.2 Activated Sludge with Expanded Capacity

Direct Impacts

Direct impacts incurred from expansion of the SBIWTP to the Hofer site for siting of secondary sedimentation basins and related facilities would affect up to 43 acres (17 ha) of land previously disturbed by commercial uses. The loss of disturbed habitat at the proposed treatment pond site is not expected to affect special-status plant and wildlife species adversely. No special-status plant species were identified on the Hofer property. Adverse effects on wildlife at the site are not expected to be significant because of the proximity of the site to adjacent open space, the lack of native habitat, the lack of foraging, and the level of existing disturbance at the site. Operational noise would be below accepted City of San Diego noise standards; therefore, no impacts are expected.

Indirect Impacts

Construction Noise and Lighting

The least Bell's vireo and coastal California gnatcatcher do not occur in the project vicinity and, therefore, would not be adversely affected by noise and lighting during construction. There would be temporary, indirect impacts to nonsensitive species adjacent to the site. Therefore, these impacts are not considered significant.

Mitigation

Standard construction techniques for reducing noise impacts to the ambient noise environment shall be employed (e.g., noise suppressing mufflers for construction equipment and compliance with local noise control ordinances).

Significance After Mitigation

No significant impacts to terrestrial biological resources are expected to occur with implementation of this alternative.

3.2.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.2.4.1 Completely Mixed Aerated System at the Hofer Site

Direct Impacts

Direct and indirect impacts are the same as for Activated Sludge with Expanded Capacity. Direct impacts incurred from construction of the treatment ponds at the Hofer property would include 43 acres (17 ha) of land previously disturbed by commercial uses. The loss of disturbed habitat at the proposed treatment pond site is not expected to affect special-status plant and wildlife species adversely. No special-status plant species were identified on the Hofer property. Adverse effects on wildlife at the site are not expected to be significant because of the proximity of the site to adjacent open space, the lack of native habitat, and the level of existing disturbance at the site. Operational noise would be below accepted City of San Diego noise standards; therefore, no impacts are expected.

With regard to concentrations of toxic compounds that could accumulate in the sludge at the bottom of the partially-mixed ponds, it is unlikely that birds or wildlife would use the ponds as a source of food or drinking water because of the steep-sided embankments and the highly agitated water. The possibility of exposure to potentially acute or chronic toxicity levels of these compounds is very low, and no significant impact is anticipated (see Appendix D, Ecological Risk Assessment).

Indirect Impacts

Construction Noise and Lighting

The least Bell's vireo and coastal California gnatcatcher do not occur in the vicinity and, therefore, would not be adversely affected by onsite noise and light during construction. There would be temporary, indirect impacts to nonsensitive species adjacent to the site. A large amount of soil could be hauled offsite during construction and the traffic noise could affect least Bell's vireos in areas of potential vireo habitat.

Mitigation

Implementation of the mitigation measures described above for the Activated Sludge with Expanded Capacity alternative would mitigate significant onsite impacts.

Standard construction techniques for reducing noise impacts to the ambient noise environment shall be employed (e.g., noise suppressing mufflers for construction equipment and compliance with local noise control ordinances).

Soil hauling would be limited to periods outside the least Bell's vireo mating season.

Significance After Mitigation

No significant impacts to terrestrial biological resources are expected to occur with implementation of this alternative when the above mitigations are implemented.

3.2.4.2 Advanced Integrated Pond System at Spooner's Mesa

Special-status plant species were identified on the western slopes of Spooner's Mesa. These species would not be removed as a result of implementing this alternative and no significant impacts are expected. Wildlife use of the site for foraging is not expected to be affected adversely because of the proximity of the site to adjacent open space and the level of existing disturbance at the site.

Direct Impacts

Impacts from construction of the ponds at the proposed Spooner's Mesa site would include the removal of up to 104 acres (42.5 ha) of disturbed land (i.e., agriculture), which includes the loss of foraging habitat for raptors. About 3.1 acres (1.3 ha) of coastal sage scrub habitat would also be removed for construction of an access road and pipeline alignment on the eastern slope of Spooner's Mesa. The removal of coastal sage scrub, a sensitive upland habitat, would be considered a significant impact.

Implementation of this alternative could have indirect effects on the coastal California gnatcatcher due to removal of potential habitat. No direct effects are expected from the proposed pipeline alignment on the northern slope because it would be located in an existing access road. The impacts and proposed mitigation measures offered as compensation for potential effects of the project are presented below.

The pipeline transporting primary effluent from the SBIWTP to Spooner's Mesa would cross Smuggler Gulch and would potentially affect a riparian corridor. The pipeline would be located within SBLO easement. Some vegetation would be temporarily removed to install the pipeline.

The settling ponds of this alternative could attract wild fowl and were identified as producing a potential risk to water birds as a result of heavy metals and toxic compounds present in the water. This risk was evaluated in an Ecological Risk Assessment (see Appendix D). The Ecological Risk Assessment found that the risks of acute and chronic toxicity were insignificant because of the steep-sided slopes of the embankments and limited birdfeeding opportunities, which would discourage continuous or long-term use by birds.

Mitigation

Unavoidable impacts to coastal sage scrub would be mitigated by the acquisition and preservation of similar habitat offsite at a suitable ratio determined in coordination with the U.S. Fish and Wildlife Service (USFWS). The extent of impact mitigation would be determined at final design after consultation the USFWS (see Appendix E).

A CWA 404 permit would be obtained and the requirements stated therein would be followed to mitigate impacts to Smuggler Gulch by the pipeline installation.

Indirect Impacts

Construction Noise and Lighting

Temporary potential indirect effects to the coastal California gnatcatcher could occur from construction activities during construction of the activated sludge ponds and installation of the associated pipelines and access road. These indirect impacts would be due to noise and potential illumination during the construction activities of occupied and potentially occupied habitat. It is unlikely that the noise generated by these activities on the top of the mesa would affect gnatcatchers using the slopes of the mesa. No impacts are anticipated from operation of the wastewater pond system.

Although previous surveys indicated the presence of gnatcatchers, current (1997) studies do not indicate the presence of gnatcatchers at or adjacent to the site. This habitat, however, is considered suitable, and the potential for their presence exists. (See Appendix E and Figure 2.2-1.) A significant impact would result if construction noise contributes to nest failure (e.g., abandonment of eggs or young) or interruption of courtship activities of the coastal California gnatcatcher.

Mitigation (Coastal California Gnatcatcher)

The following measures are proposed, based on guidelines provided from the USFWS (1994):

1. As compensation for potential noise impacts, a program to monitor the behavior of the coastal California gnatcatcher during construction shall be implemented. Information from this monitoring program can be used to form an initial data base to study the effects noise may have on the species. The monitoring program should involve the following:
   - Removal of coastal sage scrub habitat would be performed during the non-breeding season (July 31 to January 31).
   - Construction within the Spooner's Mesa and Smuggler Gulch would be restricted to a period outside the breeding season of the coastal California gnatcatcher (February 1 through July 30) to minimize any potential noise effects on nest building activities, unless construction at the edge of the gnatcatcher habitat can be limited below 60 dB. If noise levels that exceed 60 dB reach coastal California gnatcatcher habitat adjacent to construction areas within the breeding season, commercially available temporary noise curtains or other suitable controls would be required around the perimeters of the site.
   - Observations of the behavior of the coastal California gnatcatcher would be made by a qualified biologist during construction. Coastal sage scrub habitat adjacent to the construction areas would be surveyed prior to the initiation of construction to locate the territories of any gnatcatchers in the vicinity. Any coastal California gnatcatchers located shall be monitored once a week throughout the construction period. Observations relating to the location of the territory, breeding activities, and movement patterns would be recorded.
   - Monthly monitoring reports would be submitted to USIBWC by the monitoring biologist that summarize the observed behavior.
2. All of the equipment used would be in proper working condition and adequately muffled.
3. Construction lighting would be shielded away from potential gnatcatcher habitat.

Significance After Mitigation

With implementation of the above mitigation measures, the impacts would be insignificant.

3.2.5 SBIWTP with Less than Full Secondary Effluent

3.2.5.1 Advanced Primary Only

Impacts

Under this alternative, impacts were identified and addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b) for terrestrial biological resources. The reader is directed to these documents for discussion of environmental consequences. No new impacts have been identified.

Mitigation

No mitigation measures are necessary.

Significance After Mitigation

Because there are no new impacts, the impacts are insignificant.

3.2.5.2 Partial Secondary Treatment

Impacts

Under this alternative, impacts were identified and addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b) for terrestrial biological resources. The reader is directed to these documents for discussion of environmental consequences. No new impacts have been identified.

Mitigation

No mitigations are necessary in addition to those identified in the 1994 Final EIS.

Significance After Mitigation

The impact to terrestrial biological resources is insignificant.

3.2.6 Marine Biological Resources

3.2.6.1 No Action

Impacts

An Ecological Risk Assessment was performed to estimate the risk to marine biota from the effluent from each of the alternatives (see Appendix D). For the No Action alternative, chromium, copper, lead, mercury, nickel, silver, zinc, cyanide, DDT and hexachlorocyclohexane (HCH) (also known as lindane) were predicted to be present in the effluent water and/or settleable solids at levels that would pose an ecological risk. The risk from other toxic organic compounds could not be predicted conclusively because the average concentrations for these compounds were below the laboratory detection limits for the set of raw wastewater samples that were analyzed. Ecological risks were identified for the above-listed compounds because of the calculated hazard quotients for each these compounds (see Tables D-7, D-8, and D-9 of Appendix D, the Ecological Risk Assessment). For marine organisms, the larger risk is associated with the solids if they settle and accumulate to levels that could alter the abundance and diversity of benthic organisms. The estimated concentrations of these compounds would occur in the marine water and in the settleable solids in the immediate vicinity of the diffusor within the 100:1 dilution zone. These concentrations could result in minor toxicity to the marine environment but these impacts would only occur within the 100:1 dilution zone where such impacts are allowed by the Ocean Plan and the NPDES permit. The potential for toxicity impacts is not estimated to occur outside of the dilution zone. The impact is considered less than significant. Compared to the other alternatives, the degree of potential toxicity is intermediate for the No Action alternative.

Mitigation

Toxic contaminants in the water column or in newly settled sediment would be mitigated by instituting a pretreatment program in Mexico. The program would prioritize industries and institutions that generate wastes containing the compounds found in Tables D-7, D-8, and D-9 with hazard quotients greater than 1 for this alternative.

Significance After Mitigation

The risk is considered less than significant because the risk is minor and would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan and NPDES permit requirements for confining impacts to this area.

3.2.7 SBIWTP with Activated Sludge Secondary Treatment

3.2.7.1 Activated Sludge with Flow Equalization Basin

Impacts

For marine biological resources, the impacts are the same as the No Action alternative.

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk to marine biological resources is considered less than significant because the risk is minor and would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan requirements for limiting impacts to this area.

3.2.7.2 Activated Sludge with Expanded Capacity

Impacts

For marine biological resources, the impacts are the same as the No Action alternative.

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk to marine biological resources is considered less than significant because the risk is minor and would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan requirements for limiting impacts to this area.

3.2.8 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.2.8.1 Completely Mixed Aerated System at the Hofer Site

Impacts

For the effluent water from the CMA at Hofer Site alternative, the results of the Ecological Risk Assessment indicate that this alternative would result in a risk to marine biota based on the hazard quotients for the same compounds listed above for the No Action alternative (see Section 3.2.6.1). Although the hazard quotients for these compounds indicate that a risk could occur, the numerical values of the hazard quotients are less than for the No Action alternative, indicating that the effluent water from the CMA at Hofer Site alternative does not produce as high a risk to marine biota. For effluent solids, the concentrations of copper, mercury, silver, DDT, and HCH produced hazard quotients exceeding 1 (see Tables D-7, D-8, and D-9 of Appendix D, Ecological Risk Assessment). As for the No Action alternative, these risks are predicted to occur within the zone of 100:1 dilution where some impact is allowed to occur. For this reason, the impact is considered less than significant. The degree of potential toxicity is low for this alternative compared to other alternatives (next to least toxic alternative).

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk to marine biological resources is considered less than significant because the risk is minor and would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan requirements for limiting impacts to this area.

3.2.8.2 Advanced Integrated Pond System at Spooner's Mesa

Impacts

Toxic levels of the same metals and organic compounds were predicted in the effluent water from the AIPS at Spooner's Mesa alternative, the same as for the No Action alternative. The numerical values of the hazard quotients for these compounds are considerably lower than for the No Action alternative. For the effluent solids, the hazard quotients indicate potential toxicity for DDT and HCH only. This alternative is expected to result in the potential for minor toxicity to the marine environment in the immediate vicinity of the ocean outfall in the 100:1 dilution zone. The impact is considered less than significant. This alternative has the lowest degree of expected toxicity compared to other alternatives.

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk is considered less than significant because the risk to marine biological resources is minor and would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan requirements for limiting impacts to this area.

3.2.9 SBIWTP with Less than Full Secondary Effluent

3.2.9.1 Advanced Primary Only

Impacts

Toxic levels of cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, cyanide, chlorinated phenolic compounds, non-chlorinated phenolic compounds, DDT, and HCH were identified in the Ecological risk assessment as likely to occur in the water within the 100:1 dilution zone. A toxic concentration of DDT was also predicted to occur beyond the dilution zone. In effluent solids, virtually the same heavy metals and toxic organic compounds are predicted to have hazard quotients that indicate a risk for the Advanced Primary alternative as for the No Action alternative. The hazard quotients for this alternative, however, are considerably higher than for the No Action alternative. This alternative has the greatest degree of expected toxicity compared to other alternatives. Because a toxic concentration of DDT in the water is predicted to occur beyond the dilution zone, the impact is considered significant.

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk to marine biological resources is considered significant because a toxic concentration of DDT was predicted to occur beyond the 100:1 dilution zone.

3.2.9.2 Partial Secondary Treatment

Impacts

Toxic levels of the same compounds were identified for this alternative as were identified for the Advanced Primary Only alternative for effluent water. The hazard quotient values, however, were not as high (see Appendix D). Toxic levels are not predicted to occur outside of the 100:1 dilution zone. In effluent solids, this alternative is comparable to the Advanced Primary alternative because it is expected to have the same heavy metals and toxic organic compounds predicted to have hazard quotients. that indicate a risk. These levels are predicted to occur within the 100:1 dilution zone. This alternative could produce minor toxicity to the marine environment in the 100:1 dilution zone only and the impact is, therefore, considered less than significant. The degree of expected toxicity is higher for this alternative than for the other alternatives.

Mitigation

For marine biological resources, the mitigations are the same as for the No Action alternative.

Significance After Mitigation

The risk to marine biological resources is considered less than significant because the risk would occur within the 100:1 dilution zone and, therefore, conforms with the Ocean Plan and NPDES that allow some degree of impacts to occur within this zone.

3.2.9.3 Relative Ranking of Impacts to Marine Biological Resources

In Table 3.2-1, the alternatives are ranked from least to most ecological risk and impact based on the ERA.

Table 3.2-1
PROJECT ALTERNATIVE RELATIVE ECOLOGICAL RISK AND IMPACT

SEIS Alternative	Relative Risk Ranking[1]
Advanced Integrated Pond System at Spooner's Mesa Site	1
Completed Mixed Aerated System at Hofer Site	2
Activated Sludge/No Action	3
Activated Sludge with Flow Equalization Basin	3
Activated Sludge with Expanded Capacity	3
Partial Secondary Treatment	4
Advanced Primary Only	5

[1]Increasing numeric ranking indicates an increasing level of relative ecological hazard (i.e., higher risk)

3.2.10 Biological Resources Impacts—Mexico

Impacts

Adverse impacts to biological resources in Mexico would be considered significant if an action adversely affected a species, its stock, or its habitat. None of the project alternatives is anticipated to result in a direct or indirect impact to terrestrial biological resources within the Tijuana Municipality or its environs. With the exception of a small pocket of Coastal Scrub Sage (shown in Figure 2.2.2), which would not be affected by implementation of the alternatives, the existing degree of high-density residential, commercial, and industrial developments within Tijuana proximate to the project site essentially precludes the existence of quality biological resources or habitats. In addition, construction for any of the SEIS alternatives would occur outside of Mexico and would not disturb existing habitat. Measures taken to mitigate protected species in the United States would be adequate to protect these species, if any, in Mexico in the vicinity of the proposed sites for the alternatives.

All the SEIS alternatives provide a significant beneficial impact to marine biological resources in the vicinity of Tijuana, Mexico. The SBIWTP will reduce the amount of treated and untreated wastewater that enters the surf at San Antonio de los Buenos in Mexico. The impacts from the ocean discharge of toxic compounds is localized around the diffuser, which is located within United States marine waters. The impact is not significant.

Mitigation

No mitigation measures are proposed or considered necessary to alleviate potential biological resource impacts to Mexico from any of the proposed alternatives.

Significance After Mitigation

No significant impacts to terrestrial or marine biological resources in Mexico would result from construction or operation of the proposed alternatives.

3.3 Cultural and Paleontological Resources

3.3.1 Standards of Significance

Impacts to cultural resources would be considered significant if they would “affect” properties eligible for the National Register of Historic Places (NRHP). According to 36 CFR 800.9 (implementing portions of Section 106 of the National Historic Preservation Act of 1966), “affect” means altering features of the property’s location, setting, or use relevant to determining NRHP eligibility. For more information about the laws and regulations that apply to cultural resources, see Section 5.1.

In the absence of other guidance, the CEQA Appendix G Guidelines have been used to assess the significance of impacts to paleontological resources. Impacts to paleontological sites would be considered significant if they would result in the disturbance, destruction, or removal of an articulated fossil skeleton, vertebrate fossils, an intact fossil bed, substantial fossil deposits, or portions of fossil deposits, in a manner inconsistent with the standards of the Society of Vertebrate Paleontology.

3.3.2 No Action

The No Action alternative was evaluated in the 1994 Final EIS (RECON, 1994) for the SBIWTP as the Dairy Mart Road alternative. A programmatic agreement was agreed to as part of the 1994 Final EIS and was implemented prior to construction of the SBIWTP.

3.3.2.1 Impacts

No significant archaeological or historical properties would be affected. Paleontologically sensitive areas were monitored during the grading for the plant site. No significant fossil-bearing deposits were disturbed.

3.3.2.2 Mitigation

No additional mitigation measures are necessary.

3.3.2.3 Significance After Mitigation

No significant adverse impacts would result.

3.3.3 SBIWTP with Activated Sludge Secondary Treatment

3.3.3.1 Activated Sludge with Flow Equalization Basin

Impacts

The additional flow equalization basin would be sited within the footprint for the activated sludge facilities at the SBIWTP. Impacts to cultural and paleontological resources would be the same as for the 1994 Final EIS. No significant impacts would result.

Mitigation

No additional mitigation measures are necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.3.3.2 Activated Sludge with Expanded Capacity

Additional secondary sedimentation basins, pumps, and internal piping would be required to implement this alternative using the Hofer site.

Impacts

No impacts to cultural resources would result. The Hofer site has been completely surveyed for the presence of archaeological and historical properties. Although one archaeological site (CA-SDI-13,486) was recorded, it was evaluated and found to lack intact cultural deposits and was in a redeposited, disturbed context. CA-SDI-13,486 is not eligible for listing under National Register criteria and its destruction would not result in an adverse effect.

The Hofer site is underlain primarily by the Bay Point formation and alluvium. The Bay Point formation has yielded fossils of land animals and marine invertebrates in the Greater San Diego area and is considered moderately fossiliferous because of the sporadic nature of the fossil findings associated with this unit. No fossils have been reported from this formation onsite. To the south of the Hofer site, within the 300-foot buffer along the border, and to the southwest, are areas of the San Diego formation considered to have high paleontological sensitivity. The San Diego formation, however, does not appear to extend onto the Hofer site itself.

Excavation within areas of the Bay Point formation could expose or destroy fossils, which is a potentially significant impact.

Mitigation

A Programmatic Agreement for compliance with Section 106 of the National Historic Preservation Act was executed on March 11, 1994, for the SBIWTP project. No potentially National Register-listed or -eligible properties would be affected by this alternative. A letter would be transmitted to the State Historic Preservation Officer (SHPO). Concurrence from the SHPO would constitute compliance with Section 106. No additional measures are necessary.

The following mitigation measures should be implemented to reduce the potential for adverse impacts on paleontological resources resulting from construction within areas of the Bay Point Formation to an acceptable level.

Prior to grading for the plant site or conveyance pipelines, a qualified paleontologist should be retained to perform a walkover survey of the location(s) to determine if significant fossils are exposed.

If necessary, preconstruction salvage of exposed fossils would be performed by a qualified paleontologist.

A qualified paleontologist should be retained to inspect the excavations. The frequency and duration of these inspections would depend on the sensitivity of the rock units being excavated and on the rate of excavation. The paleontologist would monitor during grading in the area of exposed fossils to allow evaluation and, if necessary, salvage.

Due to the small size of some fossils present in several formations, it would be necessary to collect matrix samples for processing through fine screens.

Provisions for preparation and identification of any fossils collected should be made before donation to a suitable repository.

All fossils collected should be donated to an institution with a research interest in the materials, such as the San Diego Natural History Museum.

The report confirming the results of the monitoring program should be submitted to the USIBWC.

Significance After Mitigation

Compliance with the mitigation measures would reduce potential impacts to paleontology to less than significant levels. No significant adverse impacts would result.

3.3.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.3.4.1 Completely Mixed Aerated System at the Hofer Site

The Hofer site is adjacent to the existing SBIWTP site but was included in the 1994 Final EIS (RECON, 1994) as part of the Dairy Mart Road alternative.

Impacts

The pond treatment facilities would be sited within the area that was surveyed in the 1994 Final EIS. Impacts to cultural and paleontological resources would be the same as for the 1994 Final EIS. As described above for the Activated Sludge with Expanded Capacity alternative, much of the Hofer site is underlain by the Bay Point formation, which is considered to have moderate paleontological sensitivity. Excavation within areas of the Bay Point formation could expose or destroy fossils, resulting in a potentially significant impact.

Mitigation

Implementation of the mitigation measures described above for the Activated Sludge with Expanded Capacity alternative would mitigate significant impacts.

Significance After Mitigation

No significant adverse impacts would result.

3.3.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

Previous archeological surveys on Spooner's Mesa encompassing the proposed Spooner's Mesa project area identified 10 prehistoric archeological sites (CA-SDI-7456, 8595, 8596, 8598, 8599, 8601, 8603, 8609, 8773, and 11,100). A survey and significance evaluation for the Border Highlands project was conducted in 1989 (John R. Cook, 1989). None of the identified sites was found eligible under National Register criteria. Although the previously recorded sites would be destroyed during construction of this alternative, due to their lack of integrity or potential to yield information important to prehistory or history, the loss would not be considered a significant impact.

Spooner's Mesa is comprised of highly fossiliferous sandstones of the late pliocene San Diego formation overlain by early pleistocene Lindavista formation, which is moderately fossiliferous. Whenever rocks known to contain fossils are excavated, there is a potential for adverse and significant impacts on the region's paleontological resources. Excavation of the mesa for the ponds system could result in the destruction of sensitive paleontological resources.

Mitigation

A Programmatic Agreement for compliance with Section 106 of the National Historic Preservation Act was executed on March 11, 1994, for the SBIWTP project. No properties listed or potentially eligible for listing with the National Register would be affected by this alternative. A letter would be transmitted to the SHPO. Concurrence from the SHPO would constitute compliance with Section 106. No additional measures are necessary.

The following mitigation measures shall be implemented to reduce the adverse impacts on paleontological resources resulting from construction within any of the project areas to an acceptable level:

- Prior to grading for the plant site or conveyance pipelines, a qualified paleontologist shall be retained to perform a walkover survey of the location(s) to determine if significant fossils are exposed.
- If necessary, preconstruction salvage of exposed fossils would be performed by a qualified paleontologist.
- A qualified paleontologist shall be retained to perform inspections of the excavations. The frequency and duration of these inspections would depend on the sensitivity of the rock units being excavated and on the rate of excavation. For areas of high paleontological sensitivity, inspections should initially be on a full-time basis. The paleontologist would monitor during grading in the area of exposed fossils to allow evaluation and, if necessary, salvage.
- Due to the small size of some fossils present in several formations, it would be necessary to collect matrix samples for processing through fine screens.

- Provisions for preparation and identification of any fossils collected shall be made before donation to a suitable repository.
- All fossils collected shall be donated to an institution with a research interest in the materials, such as the San Diego Natural History Museum.
- The report confirming the results of the monitoring program shall be submitted to the USIBWC.

Significance After Mitigation

Compliance with the mitigation measures would reduce potential impacts to paleontological resources to less than significant levels. No significant adverse impacts would result.

3.3.5 SBIWTP with Less than Full Secondary Effluent

3.3.5.1 Advanced Primary Only

Impacts

This alternative would not result in new facilities at the existing SBIWTP. No impacts to cultural or paleontological resources would result.

Mitigation

No mitigation measures are necessary.

Significance After Mitigation

No significant impacts would result.

3.3.5.2 Partial Secondary Treatment

Impacts

Impacts to cultural and paleontological resources would be the same as for the No Action alternative.

Mitigation

Mitigation measures are the same as for the No Action alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.3.6 Cultural and Paleontological Impacts—Mexico

Construction and implementation of the proposed alternatives are not anticipated to affect cultural or paleontological resources of the Tijuana Municipality or environs because all of the facilities described in this SEIS would be constructed in the United States. Specific impacts to the Tijuana / Mexican cultural or paleontological environment are not addressed or quantified further within the present SEIS.

3.4 Land Use

3.4.1 Standards of Significance

Although NEPA does not provide standards of significance for evaluating land use impacts, it does require that an EIS discuss possible conflicts between a proposed action and the objectives of federal, regional, state, and local land use plans, policies, and controls; identify any inconsistencies between the proposed action and any approved state or local plans or laws; and describe the extent to which the agency would reconcile its proposed plan with the plan or law. Based on that NEPA requirement, in this SEIS, impacts to land use would be considered significant if the action would conflict with existing or planned land uses within or surrounding the project area, or if the action would conflict with:

- Existing plans and/or applicable goals, objectives, or policies of the City of San Diego
- Community plans
- Local coastal plan
- Concept plan for Tijuana River Valley Regional Open Space Park
- City of San Diego Multi-Species Conservation Plan

For more information about the regulations and permits related to land use, see Section 5.1.

3.4.2 No Action

The No Action alternative was evaluated in the 1994 Final EIS (RECON, 1994) for the SBIWTP as the Dairy Mart Road alternative. The underlying local land use plans, including the community plan, local coastal plan, and concept plan for the Tijuana River Valley Regional Open Space Park, all designate wastewater treatment facilities for the site. Traffic, odors, and dust level impacts to land uses are discussed in this section. Additional impacts are discussed in Sections 3.5 and 3.9, respectively.

3.4.2.1 Impacts

Since the 1994 Final EIS (RECON, 1994) was issued, no changes have occurred and no new impacts have been identified.

3.4.2.2 Mitigation

No additional mitigation is required beyond the 1994 Final EIS (RECON, 1994).

3.4.2.3 Significance After Mitigation

There would be no significant impacts.

3.4.3 SBIWTP with Activated Sludge Secondary Treatment

3.4.3.1 Activated Sludge with Flow Equalization Basin

Impacts

The same level and types of impacts to land use would result as for the No Action alternative described in the 1994 Final EIS (RECON, 1994).

Mitigation

No additional mitigation is required, the same as the No Action alternative.

Significance After Mitigation

There would be no significant impacts, the same as the No Action alternative.

3.4.3.2 Activated Sludge with Expanded Capacity

This alternative would require expansion of the SBIWTP to the Hofer site for siting of secondary sedimentation basins, pumps, and piping. Use of the Hofer site for wastewater treatment was evaluated in the 1994 FEIS for the SBIWTP as part of the Dairy Mart Road alternative. The 1994 Final EIS included future facilities up to 100 mgd (4,380 L/s) secondary, which would be constructed on this site. The underlying local land use plans, including the community plan, local coastal plan, and concept plan for the Tijuana River Valley Regional Open Space Park, all designate wastewater treatment facilities for the site.

Impacts

The same level and types of impacts to land use would result as for the No Action alternative described in the 1994 Final EIS (RECON, 1994).

Mitigation

No mitigation is required, the same as the No Action alternative.

Significance After Mitigation

Impacts after mitigation would be insignificant, the same as the No Action alternative.

3.4.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.4.4.1 Completely Mixed Aerated System at Hofer Site

Use of the Hofer site for wastewater treatment was evaluated in the 1994 Final EIS for the SBIWTP as part of the Dairy Mart Road alternative. In the 1994 Final EIS, consideration was given to the construction of future secondary treatment facilities of up to 100-mgd (4,380 L/s) capacity on this site. The underlying local land use plans, including the community plan, local coastal plan, and concept plan for the Tijuana River Valley Regional Open Space Park, all designate wastewater treatment facilities for the site. The current actual land use at the Hofer site is open space, a currently inactive sand and gravel quarry is located to the west, and open space and agricultural uses are located to the north.

Impacts

The same level and types of impacts would result as for the No Action alternative described in the 1994 Final EIS (RECON, 1994).

Mitigation

No mitigation is required, the same as the No Action alternative.

Significance After Mitigation

There would be no significant impacts, the same as the No Action alternative.

3.4.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Spooner's Mesa was not considered as a location for wastewater treatment facilities in the 1994 Final EIS (RECON, 1994) or Interim Operation SEIS (RECON, 1996a,b), although collectors, pumps, and conveyance lines in Smuggler Gulch were included in the assessments. The Spooner's Mesa site is currently zoned for agricultural, mineral extractive, and open space uses although it is only used as open space. The status of Spooner's Mesa has recently changed relative to two actions: (1) acquisition of portions of the mesa by the County of San Diego for the Tijuana River Valley Regional Park and (2) adoption of the regional Multi-Species Conservation Plan by the City of San Diego, which changed the underlying land use goals for the site from agriculture and sand and gravel extraction to agriculture and habitat restoration.

Impacts

Development of the ponds alternative would not be consistent with existing land use plans and policies for Spooner's Mesa. The Border Highlands Local Coastal Program designated the mesa as a sand and gravel extraction reserve area, with interim agricultural uses and commercial recreation. The mesa is designated as a Mineral Reserve Zone 2, signifying that adequate information exists to indicate significant mineral deposits are present. Development of wastewater treatment ponds would not irrevocably commit the land to nonextractive use, but would preclude mining of the deposit or interim agricultural use for the foreseeable future. Development of the mesa for wastewater treatment, contrary to uses designated in the local coastal program, would require a finding of consistency with the California Coastal Act.

The San Diego County Board of Supervisors recently approved purchase of a portion of Spooner's Mesa and surrounding land. This land comprises Parcel No. 94-0403-A and is about 400 acres (162 ha). The land is being purchased from CalMat on behalf of the County of San Diego Department of Parks and Recreation for use as a natural lands management area within the Tijuana River Valley Regional Park.(See Appendix A3 for correspondence from the County of San Diego on the purchase of a portion of Spooner's Mesa.) The County has initiated the immediate acquisition of approximately 148 acres (60 ha) of this parcel, referred to as Parcel Nos. 94-0403-B, -C, and -D. The balance of the property is subject to a purchase contract "option to acquire" clause over the next 3 years. Because portions of the parcel are being purchased with State Bond Act funds, there would be restrictions on the use of those portions. Construction and operation of the wastewater facilities on Spooner's Mesa would constitute an inconsistent and, therefore, significant land use conflict in the view of the County if these facilities were located on purchased parcels (County of San Diego, 1997). Conversion from park use to wastewater treatment for any of the property purchased with State Bond Act funds would require action by the State legislature.

Parcel Nos. 94-0403-B, -C, and -D, comprise acreage lying along the northwestern slope of Spooner's Mesa and areas to the east of Spooner's Mesa abutting Monument Road (see Appendix A3). Because construction and development of the AIPS alternative would be restricted to the top of the mesa, there does not appear to be an immediately inconsistent land use. The County's intended use of the whole of Parcel No. 94-0403-A, however, is for park land, and a significant land use conflict could occur.

Spooner's Mesa is also designated as preserve lands in the City of San Diego's Subarea Plan for the Multi-Species Conservation Program. Future uses of the mesa are designated for agriculture with eventual restoration to native scrub or grassland. Development of wastewater treatment facilities would be inconsistent with the Subarea Plan.

Mitigation

The proposed alternative would necessitate amendment to the Border Highlands Local Coastal Program and the City of San Diego's Subarea Plan for the Multi-Species Conservation Program to mitigate the inconsistency between the existing land use designations and the proposed project. Development of the mesa for the proposed pond system would also require a finding of consistency with the California Coastal Act in order to mitigate wastewater treatment methods that are contrary to uses designated in the local coastal program.

Significance After Mitigation

The provision for compensation for parklands in the Tijuana River valley and native habitat on Spooner's Mesa would mitigate the impacts to parks and the Multi-Species Conservation Program. If amendments to the Border Highlands Local Coastal Program and the Multi-species Conservation Program are granted, no significant impacts would result. If the amendments are not granted, however, significant inconsistencies between these plans and the proposed alternative would remain, and the impact would be significant.

3.4.5 SBIWTP with Less than Full Secondary Effluent

3.4.5.1 Advanced Primary Only

Impacts

The SBIWTP existing facilities would continue to be operated without expansion. No changes from existing conditions would result.

Mitigation

No mitigation is necessary.

Significance After Mitigation

No significant land use impacts would result.

3.4.5.2 Partial Secondary Treatment

Impacts

The same level and types of impacts to land use would result as for the No Action alternative described in the 1994 Final EIS (RECON, 1994).

Mitigation

The same mitigation measures as for the No Action alternative should be applied.

Significance After Mitigation

No significant impacts would result, the same as the No Action alternative.

3.4.6 Land Use Impacts—Mexico

Impacts

Impacts to land use in Mexico would be considered significant if the action would conflict with existing or planned land uses within or surrounding the project area, or if the action would conflict with local or federal land use plans or programs.

None of the project alternatives is anticipated to result in a direct or indirect impact to existing or planned land uses within the Tijuana Municipality or environs. The existing high-density residential, commercial, and industrial developments within Tijuana would be unaffected by implementation of the proposed alternatives, with the exception of varying levels of sludge truck transport into Mexico for ultimate disposal at a site yet to be determined by the Mexican government. All potential impacts to land uses by construction and operational aspects of the proposed alternatives occur within the United States. The potential for project-related traffic and transportation impacts to Mexico is discussed in Section 3.5.5. The potential for air quality and odor impacts to Mexico and their associated control measures are presented in the Air Quality Section 3.9.5.

Under the No Action alternative, development of the activated sludge secondary treatment facilities would not conflict with existing or planned future land uses in the vicinity of the project site on either side of the border. The Activated Sludge with Flow Equalization Basin and the Activated Sludge with Expanded Capacity alternatives are anticipated to result in the same general lack of significant impacts to land uses in Mexico as for the No Action alternative described above. Similarly, implementation of either the CMA at Hofer or the AIPS at Spooner's Mesa alternatives would not be expected to result in any conflicts with existing or future land uses in Mexico. For the Advanced Primary Only alternative, the SBIWTP existing facilities would continue to be operated without expansion, and no changes from existing conditions would result. For the Partial Secondary alternative, the same general lack of significant impacts to land uses in Mexico is anticipated as for the No Action alternative.

Mitigation

No mitigation is necessary.

Significance After Mitigation

No significant impacts to existing or planned land uses in Mexico would result from construction or operation of the proposed alternatives.

3.5 Traffic and Transportation

Traffic and transportation impacts are based upon the 1994 Final EIS; updated traffic volume counts from SANDAG (1996); traffic analysis from the City of San Diego's 1996 EIR for the South Bay Water Reclamation Plant and Dairy Mart Road Bridge Replacement EIR traffic analysis (LLG, 1996); and estimates of construction- and operations-related traffic based upon conceptual designs for each alternative. It is noted that the 1996 traffic volume data include traffic associated with the construction of the SBIWTP, which was completed in 1997. It also includes traffic from the construction of the SBOO, which initiated construction in 1996.

The SBIWTP has been constructed and is operating as an advanced primary treatment plant. The majority of worker commute trips and deliveries associated with operating the plant are already in effect. Additional traffic trips associated with operations for any of the alternatives to activated sludge are considered minimal increases to current traffic levels. Sludge would be trucked to a disposal site in Tijuana, using as-designed direct access from the SBIWTP to major surface roads in Mexico along the border. The number of trips per day is estimated at between five to nine trips for the alternatives.

3.5.1 Standards of Significance

Impacts to traffic and transportation would be considered significant if affected road segments would not achieve level of service "D." Level of service (LOS) is a standard methodology for evaluating road service levels, and is reported on a scale of A to F, with A representing excellent operating conditions, and F representing extremely congested conditions. The City of San Diego uses, as a local threshold of significance, a LOS of "D" during morning and afternoon peak-hour periods for vehicle circulation on major roadways and intersections.

The roadway segment analysis and the intersection operations analysis are based on methodologies presented in the *Highway Capacity Manual* (*Transportation Research Board, Special Report 209, Washington, D.C., 1994*), which is the most widely recognized standard for roadway impact analysis in the United States and provides analytical methodologies explicitly intended for assessing the types of conditions found in the regional highway network that would serve the SBIWTP.

3.5.2 No Action

The No Action alternative was evaluated in the 1994 Final EIS (RECON, 1994) for the SBIWTP as the Dairy Mart Road alternative.

3.5.2.1 Impacts

Access to the SBIWTP is taken from I-5 at Dairy Mart Road and south on Dairy Mart Road to an easterly extension of Monument Road. It is assumed that construction-related traffic would generate approximately 200 trips per day on Dairy Mart Road and the easterly extension of Monument Road from Dairy Mart Road to the SBIWTP. The effects on local traffic circulation would be similar to those experienced during construction of the headworks and advanced primary portion of the SBIWTP between 1995 and 1997. During this period, no significant traffic circulation impacts resulted from construction traffic. The four-way stop-controlled interchange at Dairy Mart Road and I-5 operated at LOS “D” or better; Dairy Mart Road south of I-5 and the easterly extension of Monument Road operated at LOS “A.” Cumulative short-term construction traffic could also include trips related to construction of the South Bay Water Reclamation Plant and Dairy Mart Road bridge improvements by the City of San Diego. This additional traffic would not cause a significant deterioration of traffic flow at Dairy Mart Road and I-5 or along Dairy Mart Road (City of San Diego, 1996).

Long-term operations traffic would be minor, up to 20 round trips per day for operators, plus occasional delivery trucks for supplies. This low level of additional traffic would not affect service levels on roads near the site.

Mitigation

No mitigation measures are proposed or considered necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.5.3 SBIWTP with Activated Sludge Secondary Treatment

3.5.3.1 Activated Sludge with Flow Equalization Basin

Impacts

Construction and operations traffic associated with this alternative would be essentially the same as for the No Action alternative. No significant short-term impacts from construction or long-term impacts from operation to local traffic circulation would result.

Mitigation

No mitigation measures are proposed or considered necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.5.3.2 Activated Sludge with Expanded Capacity

Impacts

Construction and operations traffic associated with this alternative would be essentially the same as for the No Action alternative. Access to the Hofer site would be the same as for the SBIWTP. The traffic required for construction of the additional sedimentation basins, pumps, and internal piping would not be substantially increased over the No Action alternative. No significant short-term impacts from construction or long-term impacts from operation to local traffic would result.

Mitigation

No mitigation measures are proposed or considered necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.5.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.5.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

Access to the Hofer site would be the same as for the No Action alternative. Construction of the facilities would require more extensive site preparation and grading, and the grading would result in 300,00 cubic yards (229,500 m^3) of soil that would have to be trucked elsewhere for disposal. There could also be export of contaminated soils, if any, and junk and scrap metal during the initial stages of excavation. Approximately half of the soil would be used at the SBIWTP to raise a portion of the site to match the surrounding grade. The remaining soil would be hauled offsite. Assuming the use of typical 15-cubic-yard (11.5 m^3) capacity dump trucks, disposal of this material over a 2 to 3 month construction period, and an 8-hour work day, this activity would generate up to 25 trucks per hour to the local roadway network . The destination of the soil is not known but the truck traffic would likely impact Dairy Mart Road and possibly I-905. This impact could affect the trolley crossing I-905 at Beyer Road and otherwise cause a nuisance on the travel road. The truck traffic would cause a significant short-term impact.

Mitigation

An engineering analysis would be conducted to determine whether the excavation can be reduced by comparing the present value cost of this approach to the cost of installing and operating a low-head pump. By installing a low-head pump to transfer the effluent from the primary facility to the ponds, the ponds can be constructed at a higher elevation, thereby reducing the amount of excavation required. The pump would increase the cost of construction and operations. If the pump alternative is less expensive, then the hauling of excess soil can be eliminated.

If the present value cost does not support this approach, then other traffic mitigation measures will be implemented. Trucks traffic will be limited to daylight hours. Additional traffic control measures could be implemented, as required by CalTrans and the City of San Diego. Mitigation measures for traffic impacts to terrestrial biological resources are discussed in Section 3.2.

Significance After Mitigation

If a reduced excavation can be achieved, then the impact will be insignificant. If not, then a short-term significant impact will occur.

3.5.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

Access to the Spooner's Mesa site would be via I-5 to Dairy Mart Road, south on Dairy Mart Road to Monument Road west, south from Monument Road via a currently unimproved access road in Smuggler Gulch, then up to the mesa on a newly constructed access road along the west face of Smuggler Gulch. As an alternative access route, traffic could take Tocayo Boulevard west from I-5/SR 905 to Hollister Street, a two-lane paved road, and then proceed south to Monument Road and Smuggler Gulch. Tocayo Boulevard is a four-lane road with a current volume of 10,000 ADT, and Hollister is a two-lane road with an ADT of 2,000 vehicles.

The level of construction-related traffic is anticipated to be similar to the No Action alternative. Additional grading would be required to improve access to the mesa and construct the ponds, but the earthwork for the ponds would be balanced onsite, and no offsite disposal is anticipated.

There would be additional vehicle trips from the SBIWTP to Spooner's Mesa during operations for staff, maintenance, supplies, and sludge removal relative to the other alternatives, but these additional five round trips per day would not adversely affect traffic along Monument Road and are not considered to be a significant traffic impact.

Mitigation

During construction, traffic controls such as signage, road monitors for crossing traffic, and provisions for assuring adequate sight distance at the Smuggler Gulch access road and Monument Road intersection would be implemented to minimize any potential conflicts with local traffic, equestrians, and bicyclists accessing Border Field State Park.

Significance After Mitigation

The mitigation measures would reduce potential impacts to below a level of significance. No significant adverse impacts would result.

3.5.5 SBIWTP with Less than Full Secondary Effluent

3.5.5.1 Advanced Primary Only

Impacts

As the advanced primary facilities at the SBIWTP are constructed and operating, no change to existing traffic conditions would result from this alternative. No significant impacts to traffic circulation would result.

Mitigation

No mitigation measures are proposed or considered necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.5.5.2 Partial Secondary Treatment

Impacts

Construction and operations traffic associated with this alternative would be essentially the same as for the No Action alternative. No significant short-term impacts from construction or long-term impacts from operation to local traffic circulation would result.

Mitigation

No mitigation measures are proposed or considered necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.5.6 Traffic and Transportation—Mexico

Impacts

Impacts to traffic and transportation in Mexico would be considered significant if they would cause appreciable degradation in the level of service experienced on roads in the project area.

As noted in the preceding sections, the primary traffic and transportation impacts from implementation of the various alternatives are construction-related. To varying degrees, construction traffic would affect the local roadways in the vicinity of the construction activities within the U.S., but no construction traffic is anticipated on Mexican roadways. No significant impacts to major arterials, regional highways, or border access points have been identified. Consequently, none of the project alternatives is anticipated to result in direct or indirect construction-related impacts to existing traffic capacity or transportation facilities within the Tijuana or its environs.

Most operational aspects of the proposed alternatives with the potential to impact traffic and transportation occur within the U.S. The primary potential for impacts to the existing transportation infrastructure and traffic volume within Mexico is associated with the truck trips into Mexico for sludge disposal. Sludge would be trucked to a disposal site in Tijuana using existing direct access from the SBIWTP to International Avenue across the border in Mexico. International Avenue is a major local transportation roadway with two lanes in each direction. The trucks would enter the southernmost west-going traffic lane. Depending on the alternative, about five to nine truck trips are estimated per day.

At the time of preparation of this Draft SEIS, the Mexican government had not selected a designated sludge disposal site, which could be used to assess the impacts by sludge trucks on the route. Current operational requirements call for the removal and transport of sludge from the SBIWTP to a temporary disposal site near San Antonio de los Buenos. The trucks must operate during night hours after midnight. Local Mexican traffic volumes would be expected to be low during these hours. However, given the heavy load, the low acceleration capabilities of loaded trucks, and the fact that these trucks would be merging onto International Avenue on an upward incline, it is conceivable that some existing traffic flows could be slowed. Such an effect would be temporary and transitory in nature, occurring on average once or twice per hour over an assumed 5-hour allowable period. It would be possible for traffic to pass the trucks by using the other westbound lane.

Regardless of the final sludge disposal site, the sludge trucks must pass through a major roadway interchange, the interchange from International Avenue to Pasco Playas de Tijuana and Libramiento Sur, the inner loop. This interchange is classified as a heavy vehicular traffic intersection. The interchange would be potentially impacted by the sludge trucks, although the impact is considered less than significant, given the hours of allowable operation.

Mitigation

Mitigation for traffic impacts will be the responsibility of Mexico.

Significance After Mitigation

Mexico will be responsible for mitigating to a level of insignificance.

3.6 Socioeconomics and Environmental Justice

This section evaluates those aspects of the SBIWTP that could pose the potential for significant impacts to socioeconomic resources in the project vicinity. These effects include those associated with the project's potential to induce economic growth, as well as impacts to minorities and low-income populations.

3.6.1 Standards of Significance

3.6.1.1 Growth Inducement

The significance of growth-inducing impacts is typically assessed in terms of related effects on other socioeconomic factors, such as housing, public services, and local government expenditures. Therefore, project impacts would be considered significant if the employment created by the project would induce substantial growth or concentration of population and a need for substantial increases in infrastructure requirements under one or more of the following conditions:

- Increased demand for public services would reduce levels of service below existing or locally acceptable levels and/or require additional personnel or facilities.
- Increased demand for additional housing could not be filled by available supply or by timely development of affordable and suitable housing.
- Revenue sources of local governments could not meet project-induced costs (e.g., increased costs associated with public health and safety).

3.6.1.2 Environmental Justice

Executive Order (EO) 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994) requires federal agencies to make the achievement of environmental justice part of their mission by identifying and addressing disproportionately high and adverse human health or environmental impacts of their programs, policies, and activities on minority and low-income populations. For this document, project impacts would be considered to have a disproportionately high adverse impact to minority and low-income populations if a significant environmental or human health impact would occur with greater frequency for those populations than for the general population.

3.6.2 No Action

3.6.2.1 Impacts

Local and Regional Economics

Under the No Action alternative, the SBIWTP would continue to treat a maximum raw sewage influx of 25 mgd (1,095 L/s) by advanced primary treatment followed by activated sludge secondary treatment. The SBIWTP's operating and maintenance expenses would provide a steady, long-term benefit by injecting approximately $7 million, with $5.5 million in wages and expenditures into the regional economy every year. Treatment works operation and maintenance presently employs a permanent staff of about 15 persons.

Because of the low-intensity land usage in the South Bay area and the fact that the majority of the existing SBIWTP facilities have been installed on undeveloped and public lands, no significant economic impacts to existing land uses from the continued operation of the SBIWTP are anticipated.

Under the No Action alternative, operation of the SBIWTP in its present configuration is expected to continue to exert a positive economic effect on the local and regional economy by preventing dry-weather sewage flows into the United States and reducing the potential for contamination and quarantine of lands previously impacted by sewage. As a result, the tourist and recreation industry in the south San Diego Bay area is anticipated to experience economic improvement.

Environmental Justice Concerns

As noted in Section 3.7 of this SEIS, no potentially significant health and safety risks to any member of the general population located near the SBIWTP or along associated transportation corridors have been identified. In addition, review of the potential environmental effects presented throughout Chapter 3, Environmental Consequences, has identified no potentially adverse, significant, or unmitigated environmental impacts to any populations in the vicinity of the SBIWTP. Consequently, there is no evidence to suggest that minority and/or low-income populations would be subjected to disproportionately high or adverse impacts as a result of the No Action alternative.

3.6.2.2 Mitigation

No mitigation measures are required for this alternative.

3.6.2.3 Significance After Mitigation

No significant adverse impacts would result.

3.6.3 SBIWTP with Activated Sludge Secondary Treatment

3.6.3.1 Activated Sludge with Flow Equalization Basin

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment methodology or technology would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.6.3.2 Activated Sludge with Expanded Capacity

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment methodology or technology would not substantially alter daily operations of the SBIWTP. It is anticipated that an additional 3 people would be hired to operate the facility.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.6.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.6.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment technology would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility. The Hofer site is not located near any U.S. residential area or pockets of housing, and no significant environmental impacts to any populations are expected from this alternative.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.6.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment technology would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility. The Spooner's Mesa site is not located near any U.S. residential area or pockets of housing, and no significant environmental impacts to any populations are expected from this alternative.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.6.5 SBIWTP with Less than Full Secondary Effluent

3.6.5.1 Advanced Primary Only

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment methodology or technology would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

The potential for adverse impacts is not significant for this alternative.

3.6.5.2 Partial Secondary Treatment

Impacts

The potential impacts under this alternative would be essentially identical to those of the No Action alternative. A change in secondary treatment methodology or technology would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility.

Mitigation

No mitigation measures are required for this alternative.

Significance After Mitigation

No significant adverse impacts would result.

3.6.6 Socioeconomic and Environmental Justice Impacts—Mexico

Construction and implementation of the proposed project are not anticipated to affect the present or future socioeconomic characteristics of the Tijuana Municipality or environs. Therefore, specific impacts to the current Tijuana / Mexican socioeconomic environment have not been addressed or quantified further within the present SEIS.

3.7 Public Health and Safety

This section evaluates those aspects of the project alternatives that could pose the potential for significant adverse impacts to public health and safety. These potential adverse effects include those associated with project-related vectors, hazardous materials, pathogens, and hazardous wastes. This section also discusses, where applicable, mitigation measures for public health and safety. Specific health and safety impacts associated with the SBOO discharge are discussed in Section 3.1.2.

3.7.1 Standards of Significance

NEPA has no formal definition of threshold of significance for public health and safety impacts of a project. Appendix G of the CEQA Guidelines states that a proposed project generally would be considered to result in a significant effect on the environment if it would "[c]reate a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected." In the absence of other guidance, the CEQA definition of significance is used in this document.

The proposed project would result in a significant impact to public health and safety if:

- It is not designed, constructed, or operated in a manner consistent with all applicable regulations governing the handling of hazardous and nonhazardous waste.
- It produces an increase in human contact with pathogens.
- It results in an increase in the mosquito vector breeding hazard, or other vector associated hazards.
- Workers are exposed to health and safety hazards because the workplace environment is not in compliance with procedures mandated by statute, including measures required under the 1970 Occupational Safety and Health Act .

3.7.2 No Action

3.7.2.1 Impacts

Vectors

Under the No Action alternative, the SBIWTP would treat a raw sewage influx of 25 mgd by advanced primary treatment followed by activated sludge secondary treatment. Operation of the SBIWTP would substantially interdict the potential flow of raw sewage into the Tijuana River valley. During dry weather, wastewater flows up to 13 mgd in the river are diverted to the Tijuana collection system. During wet weather, flows are not diverted to the .collection system. For this reason, the No Action alternative would reduce, although not entirely eliminate, the mosquito vector breeding hazard associated with sewage-laden water effluent originating in Mexico.

The continued prevention of dry-weather sewage flow into the Tijuana River valley is expected to result in keeping the beaches open longer on the 2.5-mile (4 km) stretch of beach from the mouth of the river north to Seacoast Drive. Contamination and beach closures, however, could persist as a result of continued urban runoff from the surrounding areas, potential effluent spills from the force main and conveyance canal in Mexico, and discharges of untreated wastewater by the treatment plant at San Antonio de los Buenos in Mexico.

Hazardous Materials

The majority of the compounds used at the SBIWTP would be nonhazardous to the general public. Chlorine gas would not be used at the SBIWTP. For emergency disinfection and routine plant operation, sodium hypochlorite would be stored onsite in accordance with hazardous materials storage requirements. Sodium hypochlorite is a liquid and does not pose the risk of toxic gas release as does chlorine gas. Liquid leaks would be contained by a double containment system. Sodium bisulfite would be used for dechlorination. Sodium bisulfite is not a hazardous compound. Sulfuric acid is used and stored on site. This compound is hazardous and special precautions are required to transport, store, use, and report this compound. Nonhazardous polymers would be used for settling in the advanced primary process. Other nonhazardous compounds associated with advanced primary treatment, such as ferric chloride, would also be used routinely at the plant.

Highway access from I-5 to the SBIWTP site would be direct, obviating the need to transport chemicals through residential neighborhoods. Truck traffic would pass by one residential neighborhood adjacent to Dairy Mart Road. The site is located in an area that is generally rural and lacks a highly concentrated population. Future land use designations in this vicinity would continue the existing low-density usage; therefore, risk to public health and safety from potential truck spills and accidental release of chemicals is considered to be less than significant.

Pathogens and Hazardous Wastes

As noted in Appendix B4, no further disinfection of treated wastewater would be required for the No Action alternative, under normal operating conditions, prior to discharge to the ocean, to reduce coliform bacteria levels below public health protective standards. In addition, sludge produced as a result of wastewater treatment under the No Action alternative undergoes a lime stabilization process prior to offsite disposal, which effectively disinfects potentially hazardous pathogens.

Normal operations of the SBIWTP would entail the routine use of various quantities of miscellaneous hazardous substances and materials. Hazardous substances used in the treatment process could pose a potential public health impact in the event of an accidental release to the environment and/or inadvertent exposure.

As identified in Appendix B3, evaluation of SBIWTP treatment efficiencies in removing pollutants of concern from the waste stream indicates that concentrations of these pollutants in processed sludge could exceed California regulatory criteria for hazardous waste designation for cadmium, total chromium, and selenium; thus, a significant potential human health risk exists during the processing and loading of the sludge onto trucks for transport. This risk does not apply to the transport of the sludge on public roads because the sludge is transported 300 feet on a private road to the border, where the trucks enter Mexico for disposal.

3.7.2.2 Mitigation

In the event of a coliform level exceeding the limits, emergency disinfection and notification would be implemented. As necessary and appropriate, the SBIWTP would be required to prepare a RMP under Title III (Section 112) of the 1990 Clean Air Act Amendments, for any processes that use or store specified flammable and toxic materials above certain TQs. This mitigation would apply for the storage of sodium hypochlorite to prevent potential injury to workers. Hazardous materials storage requirements would be implemented.

To mitigate human health risk from potentially hazardous sludge, training of personnel and hazardous waste management and handling procedures would be implemented. Personnel would be required to wear protective gear when exposure may occur and hazardous waste recordkeeping requirements would be implemented. The sludge handling facilities would have designated restricted access areas where necessary and signage to inform workers of the risk.

3.7.2.3 Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, in conjunction with preparation of an RMP, emergency disinfection, and hazardous sludge handling procedures, would reduce the potential for public health and safety impacts to less than significant.

3.7.3 SBIWTP with Activated Sludge Secondary Treatment

3.7.3.1 Activated Sludge with Flow Equalization Basin

Impacts

The potential impacts associated with SBIWTP operation, including vectors, hazardous materials, pathogens, and hazardous waste, including sludge, would be the same as for the No Action alternative.

Mitigation

Mitigation requirements would be the same as for the No Action alternative.

Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, in conjunction with preparation of an RMP, emergency disinfection, and hazardous sludge handling procedures, would reduce the potential for public health and safety impacts to less than significant.

3.7.3.2 Activated Sludge with Expanded Capacity

Impacts

The potential impacts associated with SBIWTP operation, including vectors, hazardous materials, pathogens, and hazardous waste, including sludge, would be the same as for the No Action alternative.

Mitigation

Mitigation requirements would be the same as for the No Action alternative.

Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, in conjunction with preparation of an RMP, emergency disinfection, and hazardous sludge handling procedures, would reduce the potential for public health and safety impacts to less than significant.

3.7.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.7.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

Potential impacts associated this alternative would be the same as for the No Action alternative for vectors, hazardous materials, and pathogens in sludge, even though the secondary sludge would be generated in a series of mixed aerated ponds. Pathogens in the effluent are not expected to exceed Ocean Plan limits and would not require disinfection.

To prevent mosquitoes and rodents, the as-designed ponds would be lined with concrete at the water's edge, mechanical aeration would continuously agitate the water surface, and scum mats would be prevented from forming by the agitation and by use of scum ramps. All of these design elements will prevent mosquito breeding conditions.

Removal of the conventional primary sludge would occur on a daily basis and be processed and stabilized using the lime stabilization process. Removal and disposal of the secondary sludge is predicted to occur about every 4 or 5 years, during which time the pond would be drained and the sludge allowed to air-dry prior to removal. Although there is a potential for worker exposure to the sludge at this time, the sludge would be already stabilized as a result of anaerobic digestion at the pond bottom. Anaerobic digestion would reduce pathogens to a level comparable to the pathogen level found in lime-stabilized sludge.

There would be no need for further stabilization of the sludge and, hence, no significant potential for adverse health impacts (see Appendix B3).

As identified in Table 19 of Appendix B3, concentrations of heavy metals and toxic organic compounds are not predicted to produce hazardous sludge in the conventional primary sludge from this alternative. The conventional primary sludge comprises the large majority of the sludge produced by this alternative and represents all of the sludge that would have to be handled on a daily basis. Appendix B3 also identifies that the secondary sludge from this alternative may exceed California Title 22 criteria for hazardous waste designation because of elevated concentrations of chromium, copper, lead, mercury, and nickel as compared to the Soluble Threshold Limit Concentrations (STLCs) in accordance with the methodology explained in Appendix B3. Of all the alternatives, this alternative may produce the least amount of hazardous sludge and would not produce hazardous daily sludge from the primary facility.

The identified sludge handling process is to drain one treatment train at a time, air-dry the remaining sludge, load the sludge onto trucks, and transport the sludge through the direct-access gate to Mexico. A potentially significant risk to workers could occur during this process, when the sludge is loaded onto the trucks, because the sludge exposure could occur from dermal control, inhalation, and possibly ingestion.

Mitigation

The project design requirements discussed above would mitigate vector breeding.

Mitigation requirements would include those for the No Action alternative. In addition, a monitoring program would be established to track the concentrations of metals and toxic organic compounds in the settled sludge in the bottom of the partially mixed aerated ponds. This monitoring program is necessary given the level of uncertainty in available data. Sludge might not be hazardous until long-term accumulation of metals occurs. As a result, the monitoring program will be established as a preventive measure, and the sludge would be sampled at regular intervals and, if possible, removed before concentrations exceed regulatory thresholds for hazardous waste. In that the digested sludge on the pond bottom requires less than a year to stabilize, there is no additional risk of exposing workers to pathogens by removing the sludge on an approximately annual basis.

During air-drying operations, airborne dust would be monitored nearby the workers and at the perimeter of the pond, although offsite exposure is unlikely. Workers will be required to wear protective gear, including respirators. Respirators will be removed only if air monitoring results indicated that a hazard does not exist. If the dust is determined to pose a health risk, then air drying would be discontinued. Sludge removal from the ponds would thereafter be accomplished by dredging, pumping the sludge to the gravity belt thickeners for liquid removal, then further processing with lime if necessary to achieve the desired moisture content.

Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, preparation of the RMP, emergency disinfection, and implementation of hazardous sludge handling procedures described above would reduce the potential for public health and safety impacts to less than significant.

3.7.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

Potential impacts associated with this alternative are similar to the impacts identified for the Hofer site alternative. The daily sludge produced by this alternative is not expected to be hazardous although the sludge produced in the ponds would be hazardous. A potential risk exists from the transport of dried sludge from Spooner's Mesa to the SBIWTP for disposal in Mexico. The treatment ponds would be drained and sludge removed to Mexico approximately every 10 years. The sludge would be transported less than 5 miles (8 km) through a rural area and past some residences. The risk for exposure to inhabitants is low.

Mitigation

Mitigation requirements would be the same as for the Hofer site alternative. In addition, sludge transport would occur in Department of Transportation approved vehicles and according to hazardous waste handling and transport requirements. If the sludge is not air dried, but must be dredged, then the dredged sludge would be returned to the SBIWTP by trucks. If the dredged sludge were hazardous, the same mitigations would apply.

Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, in conjunction with preparation of an RMP, emergency disinfection, and hazardous sludge handling procedures, would reduce the potential for public health and safety impacts to less than significant.

3.7.5 SBIWTP with Less than Full Secondary Effluent

3.7.5.1 Advanced Primary Only

Impacts

The potential impacts associated with SBIWTP operation for vectors, hazardous materials, and hazardous waste would be the same as for the No Action alternative, although the sludge may potentially exceed California hazardous waste limits for selenium but not chromium. A potential exists for coliform levels frequently exceeding Ocean Plan limits at depth in some kelp beds. (See Section 3.1.2.) This potential could result in health risks to divers.

Mitigation

Mitigation requirements would be the same as for the No Action alternative, except there would likely be a higher need for emergency disinfection. (See Section 3.1.2.)

Significance After Mitigation

The mitigation measures incorporated within the existing SBIWTP design, in conjunction with preparation of an RMP, emergency disinfection, and hazardous sludge handling procedures, would reduce the potential for public health and safety impacts to less than significant. Because disinfection would occur as a reactive measure, the impact by potential coliform exceedances is not fully mitigatable and therefore remains significant.

3.7.5.2 Partial Secondary Treatment

Impacts

Potential impacts associated with this alternative would be the same as for the No Action alternative, except that the potential for coliform exceedances in kelp beds is similar to the Advanced Primary Only alternative, although not quite as frequent.

Mitigation

Mitigation requirements would be the same as for the No Action alternative for impacts, except there likely would be a need for emergency disinfection and notification.

Significance After Mitigation

The significance after mitigation is the same as for the Advanced Primary Only alternative. The impact by potential coliform exceedances is not fully mitigatable and therefore remains significant.

3.7.6 Public Health and Safety—Mexico

3.7.6.1 Impacts

Impacts on human health and safety in Mexico would be considered significant if they would produce an increase in human contact with pathogens; would increase vector hazards; would result from design, construction, or operation in a manner inconsistent with applicable regulations governing the handling of hazardous and nonhazardous waste; or would expose workers to health and safety hazards.

Vectors

As noted previously and for all alternatives, the SBIWTP would continue to substantially interdict the potential flow of raw sewage into the Tijuana River valley, reducing, although not entirely eliminating, the mosquito vector breeding hazard associated with sewage-laden surface flows originating in Mexico. This is a positive impact, benefiting Mexico as well as the United States. Contamination and beach closures could persist as a result of continued urban runoff from the surrounding areas, potential raw wastewater spills from the conveyance canal in Mexico, and discharges of raw wastewater at San Antonio de los Buenos in Mexico. However, these are not project-related impacts.

Pathogens

An evaluation of potential coliform levels was performed (see Appendix C) for the nearest kelp bed. The results of this analysis suggest that the discharge from any alternative would not create a risk to human health at a level that would be considered significant.

Hazardous Materials

The majority of the compounds used at the SBIWTP and for all alternatives would be non-hazardous. Chlorine gas would not be used at the SBIWTP so hazardous gas releases would not occur. For emergency disinfection, sodium hypochlorite would be stored onsite. Sodium hypochlorite is a liquid and does not pose a risk of toxic gas releases as does chlorine gas. Consequently, risk to public health and safety in Mexico from potential truck spills and accidental release of chemicals is considered to be less than significant.

Hazardous Wastes

As indicated in Appendix B3, evaluation of SBIWTP treatment efficiencies in removing pollutants of concern from the waste stream indicates that concentrations of these pollutants in processed sludge may exceed Mexican regulatory criteria for hazardous waste designation. For the No Action alternative, Activated Sludge with FEB alternative, the Activated Sludge with Expanded Capacity, and the Partial Secondary alternative, the sludge may exceed the Mexican regulatory limits for cadmium and selenium. Consequently, potential human health risks exist from inadvertent exposure to sludge during transport and disposal of the sludge from the full or partial activated sludge alternatives.

From the Advanced Primary Only alternative, the sludge is not expected to be hazardous based on Mexican standards.

For the CMA at Hofer site and AIPS at Spooner's Mesa site alternatives, the conventional primary sludge is not expected to exceed the limits. From the secondary ponds, the sludge may exceed the Mexican criterion for nickel. Bis (2-chloroethyl) ether, 2,4-dinitrotoluene, and hexachlorobenzene all could potentially produce a hazardous leachate and exceed the TCLP. However, none of these compounds have estimated average influent concentrations above the laboratory detection limits. In the estimates, the detection limits were assumed to represent actual concentrations. It is very possible that these compounds are not present.

For the secondary alternatives that use activated sludge, the potential risk would occur on a daily basis. For the secondary alternatives that use ponds, the potential risk would occur on a multi-year basis. The full impact from sludge transport and disposal is largely dependent upon the ultimate disposal site, which is as yet undetermined. Currently, the impact can be evaluated for that portion of the route that extends from the direct-access gate from the SBIWTP, along International Avenue, and to the interchange with Paseo Playa de Tijuana and Libramiento Sur. A significant impact could occur if a spill along this route were to cause an inadvertent exposure. Mexico is currently evaluating long-term sludge disposal options. The environmental impacts associated with sludge transport and disposal would be analyzed by CESPT and approved by the Department of Ecology (Direccion General de Ecología).

3.7.6.2 Mitigation

Sludge transport must be conducted according to Mexican standards for hazardous waste from the No Action, Activated Sludge with FEB, and Activated Sludge with Expanded Capacity alternatives and from the ponds of the Hofer site and Spooner's Mesa site alternatives. (See Chapter 5 for the applicable standards.) This means that the sludge must be accompanied by the proper documentation and signage, contained appropriately, and handled by trained workers. Traffic warning signals at the access road from the SBIWTP and the trucks would be installed to prevent rear-end collisions that could cause a spill (see Section 3.5.6). In addition, CESPT and the Department of Ecology may institute additional measures once the disposal site is identified.

3.7.6.3 Significance After Mitigation

The mitigation measures incorporated herein would reduce the potential for public health and safety impacts in Mexico to less than significant.

3.8 Scenic, Visual, and Recreational Resources

This section evaluates potential impacts to scenic and visual resources and recreational resources by each of the proposed alternatives. Section 3.8.2 addresses scenic and visual resources. Section 3.8.3 addresses recreational resources.

3.8.1 Standards of Significance

NEPA does not provide standards of significance for scenic, visual, or recreational resources. In the absence of other guidance, the significance criteria provided by the CEQA Guidelines will be used here.

3.8.1.1 Scenic and Visual Resources

Pursuant to Appendix G of the CEQA Guidelines, a project is normally considered to have a significant effect on the environment if it has "a substantial demonstrable negative aesthetic effect, ... conflict with established recreational ... uses of the area, ... or ... breach published national, state, or local standards relating to ... litter control." Appendix I of the CEQA Guidelines includes, as examples of "negative aesthetic effect," the obstruction of a scenic vista or public view or impairment of an existing view by introducing an aesthetically offensive visual feature.

3.8.1.2 Recreation

Implementation of the proposed alternatives would be considered to have a significant impact on recreation in the project area if they would result in a net loss of existing recreational opportunities, a displacement of recreational uses, or a degradation of recreational value. The definition of a "degradation of recreational values" assumes a measurable change in the physical environment that could negatively affect a recreational user’s sense of sight, sound, or smell (e.g., increased levels of noise or pollutant emissions). Thresholds of significance for evaluating these changes are based on the potential for the project to cause physical effects at adjacent recreational areas, such as:

- Introduction of a substantially visible light source
- Visual contrast with the surrounding landscape from views within established recreational areas
- Increase in the amount of windblown debris and/or dust in the recreational area
- Noise level increase greater than 3 dBA (provided that a recreational area located near the noise source would be impacted and that a 65-CNEL noise contour extends far enough from the noise source to adversely affect any recreational areas)

- Increase in emission of any odorous substance that causes the ambient air at any recreational area to be odorous

3.8.2 Scenic and Visual Resources

3.8.2.1 No Action

Impacts

No new impacts have been identified that were not addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b). The reader is directed to these documents for a discussion of environmental consequences.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant scenic/visual impacts would occur under this alternative.

3.8.2.2 SBIWTP with Activated Sludge Secondary Treatment

3.8.2.2.1 Activated Sludge with Flow Equalization Basin

Impacts

Under this alternative, no new impacts have been identified that were not addressed in the 1994 Final EIS and Interim Operation SEIS (RECON, 1994; 1996a,b). The reader is directed to these documents for discussion of environmental consequences.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant scenic or visual impacts would occur under this alternative.

3.8.2.2.2 Activated Sludge with Expanded Capacity

Impacts

Under this alternative, the secondary treatment facilities would be sized to treat a 50-mgd (2,190 L/s) peak flow. This would require that 16 secondary clarifiers be constructed instead of the eight clarifiers required under the No Action alternative. All other secondary treatment facilities to be constructed under this alternative would be the same as the No Action alternative.

Effects on visual resources would be similar to those discussed under the No Action alternative, except that the additional clarifiers would extend onto a portion of the Hofer site. This expansion onto the Hofer site would cover less than 15 acres and would not be a substantial increase in overall facility size. The expansion would not extend outside of the original SBIWTP site evaluated in the 1994 Final EIS, which included the Hofer site. No adverse impacts on visual or scenic resources would be expected under this alternative.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant visual or scenic impacts would occur under this alternative.

3.8.2.3 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.8.2.3.1 Completely Mixed Aerated System at Hofer Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the Hofer site adjacent to the existing SBIWTP for treatment of 25-mgd (1,095 L/s) average flow with peaks of 50 mgd (2,190 L/s). Facilities would include six ponds (four fully mixed, two partially mixed), a control building, distribution structures, and pump stations. Development of the Hofer site would require raising the western and southern portions of the site 50 feet (15.2 m) above its existing elevation for flood control purposes. This elevation extension would match the elevation of the existing SBIWTP site. Slopes would be planted with low-lying native vegetation. Overall, development of ponds on the Hofer site would not alter the visual character of the area, given that the ponds would be developed at grade level, which contrasts with the existing SBIWTP that represents a highly visible feature in the area.

As with the No Action alternative and the activated sludge alternatives, the pond area would primarily be visible to the livestock, agricultural and quarry operation west of the site. Immediately south of the site is the international boundary; no existing land uses or activities would be affected. As with the previous alternatives, views from the eastern side of Spooner's Mesa would include the Hofer site ponds, but no obstruction of views would occur. Thus, scenic and visual effects from Hofer site pond development would be minimal. Additional fencing would be provided on the outside of the treatment plant, which would match existing fencing. Because of the proximity of other fences, impacts are not expected to be significant.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant scenic and visual impacts would occur under this alternative.

3.8.2.3.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the currently undeveloped Spooner's Mesa site to treat 25 mgd (1,095 L/s) average flow and peaks of 50 mgd (2,190 L/s). New facilities introduced at the site would include a total of 15 ponds (12 aerated), and a control building. Other nearby facilities would include distribution structures and pump stations, as well as an access road that would be constructed on the east side of Spooner's Mesa.

Visual impacts associated with this alternative would be minimal. The ponds would not be visible to surrounding areas in the Tijuana Valley since Spooner's Mesa is 300 feet (91 m) higher in elevation than surrounding areas and the ponds would be situated at grade level. The access road to the ponds would be developed along the existing coastal sage scrub-covered slope. Thus, a road along this slope would be noticeable along the Monument Road to the north and to the residences located on the north side of Monument Road. The road, however, would not represent a significant change in the visual landscape of the area.

For those people who might be present at the top of the mesa, primarily border patrol officers, the ponds would create a major visual change from the existing open space. Because trespassing is prohibited, there would be no significant loss of viewing opportunities. If part of the top of the mesa were to become park land with trails providing public access, the facility would produce a visual impact.

Overall, the scenic and visual changes associated with this alternative are not expected to be significant, and thus no adverse impacts are anticipated.

Mitigation

No mitigation is required because no impacts are expected to occur. If part of the top of the mesa became park land, landscaping would be improved to shield the public's view of the treatment plant.

Significance After Mitigation

No significant scenic or visual impacts would occur under this alternative.

3.8.2.4 SBIWTP with Less than Full Secondary Effluent

3.8.2.4.1 Advanced Primary Only

Impacts

Under this alternative, no secondary treatment facilities, nor equalization of flow are provided. Thus, no new construction activities would be required. The existing SBIWTP would be operated as under current conditions, utilizing primary treatment only, with ultimate discharge to the SBOO.

Since no physical or operational changes would be taking place under this alternative, no visual changes will occur; therefore, there would be no effects on visual and scenic resources.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant scenic or visual impacts would occur under this alternative.

3.8.2.4.2 Partial Secondary Treatment

This alternative is similar to the No Action alternative, except that flows greater than 25 mgd (up to 50 mgd) would receive advanced primary treatment and would then be bypassed around the secondary process to the SBOO. The proposed additional facilities for secondary treatment are the same as those described in the No Action alternative.

Effects on visual resources would be the same as those discussed under the No Action alternative. No adverse impacts on visual or scenic resources would be expected.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No significant scenic and visual impacts would occur under this alternative.

3.8.3 Recreational Resources

3.8.3.1 No Action

Impacts

Under the No Action alternative, secondary treatment facilities would be constructed at the existing SBIWTP as described earlier. No impacts on existing or proposed area parks or other recreational uses would occur since the secondary facilities would be constructed at the existing SBIWTP site.

Discharge of secondary-treated effluent to the SBOO would meet the water quality standards of the California Ocean Plan designed to protect recreational resources. Therefore, no negative impacts to coastal and ocean recreational resources are anticipated. Conversely, the secondary treated effluent represents an improvement in water quality over the previous discharges of raw sewage from the Tijuana River during dry weather, as well as over primary treated effluent from the SBOO under the interim SBIWTP operating conditions.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No recreational resource impacts would occur under this alternative.

3.8.3.2 SBIWTP with Activated Sludge Secondary Treatment

3.8.3.2.1 Activated Sludge with Flow Equalization Basin

Impacts

This alternative would be similar to the No Action but would include a flow equalization basin as well. As with the previous alternatives, no recreational resource impacts would occur, except beneficial impacts by improvements to coastal water quality as described in Section 3.1.2.3.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No recreational resource impacts would occur under this alternative except beneficial impacts to coastal water quality.

3.8.3.2.2 Activated Sludge with Expanded Capacity

Impacts

Additional secondary treatment facilities would be constructed on the existing SBIWTP site and on the Hofer site to treat varying peak flows. No effects on recreational resources would occur, except beneficial impacts by improvements to coastal water quality as described in Section 3.1.2.3.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No recreational resource impacts would occur under this alternative, except beneficial impacts to coastal water quality.

3.8.3.3 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.8.3.3.1 Completely Mixed Aerated System at Hofer Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the Hofer site adjacent to the existing SBIWTP. The ponds are not located on property proposed for park development nor adjacent to any existing public parks or other recreational resources. Thus, no effects on recreational resources would occur under this alternative.

Discharge of secondary-treated effluent from the Hofer ponds to the SBOO would meet Ocean Plan water quality standards designed to protect recreational resources. Therefore, no negative impacts to coastal and ocean recreational resources are anticipated under this alternative. The secondary-treated effluent represents an improvement in water quality over the previous discharges of raw sewage from the Tijuana River during dry weather, as well as over the primary treated effluent from the SBOO under the interim SBIWTP operating conditions. Improvements in coastal water quality are predicted as discussed in Section 3.1.2.4.

Mitigation

No mitigation is required since no impacts are projected.

Significance After Mitigation

No recreational resource impacts would occur under this alternative, except beneficial impacts to coastal water quality.

3.8.3.3.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

This alternative would require the addition of 15 secondary treatment ponds and associated facilities at the currently undeveloped Spooner's Mesa site. Nearby facilities would include distribution structures and an access road constructed on the east side of Spooner's Mesa.

Development of a secondary treatment pond system on Spooner's Mesa would conflict the County of San Diego's plan to purchase the whole of Spooner's Mesa for park land. This impact is discussed in detail in Section 3.4, Land Use.

Discharge of secondary-treated effluent from the Spooner's Mesa to the SBOO would meet Ocean Plan water quality standards designed to protect recreational resources. Therefore, no negative impacts to coastal and ocean recreational resources are anticipated under this alternative. The secondary-treated effluent represents an improvement in water quality over the previous discharges of raw sewage from the Tijuana River during dry weather, as well as over the primary treated effluent from the SBOO under the interim SBIWTP operating conditions. Beneficial impacts would occur by improving coastal water quality as discussed in Section 3.1.2.4.

Mitigation

If a portion of the top of Spooner's Mesa were purchased by the County and developed into park land with public access, then the design of the quiescent settling ponds and the landscaping would be modified to enhance the public's enjoyment of the mesa. The pond facilities could be placed away from the western edge of the mesa top to allow the public to access this area for recreational and viewing purposes.

Significance After Mitigation

Secondary pond development at Spooner's Mesa would not significantly impact planned recreational resources if the planning and design of the pond facilities and the park lands are coordinated to optimize the public's enjoyment of the mesa and view to the west. Beneficial impacts would occur to coastal water quality.

3.8.3.4 SBIWTP with Less than Full Secondary Effluent

3.8.3.4.1 Advanced Primary Only

Impacts

Under this alternative, no secondary treatment facilities or equalization of flow are provided. Thus, no new construction activities would be required. The existing SBIWTP would be operated as under current conditions, using primary treatment only, with ultimate discharge to the SBOO.

As with the previous alternatives, no impacts on existing or proposed area parks would occur. However, since no secondary treatment would occur, effluent discharge to the SBOO would be of less quality than under the No Action alternative. A potential exists for divers in kelp beds at depths below 32.8 feet (10 m) to encounter coliform bacteria levels that exceed the water quality limits during several months of the year.

Mitigation

If coliform levels exceed allowable limits, disinfection of the effluent would be provided until coliform levels drop below the limits. Signs and notices would be posted to notify divers.

Significance After Mitigation

The impact of coliform levels may be significant if occurrences are frequent.

3.8.3.4.2 Partial Secondary Treatment

Impacts

This alternative is similar to the No Action alternative, except that peak flows would receive advanced primary treatment only. The proposed additional facilities for secondary treatment are the same as those described in the No Action alternative. As with the No Action alternative, no impacts to nearby existing or proposed park facilities are expected. A potential exists for divers in kelp beds at depths below 32.8 feet (10 m) to encounter coliform bacteria levels that exceed the water quality limits during several months of the year.

Mitigation

If coliform levels exceed allowable limits, disinfection of the effluent would be provided until coliform levels drop below the limits. Signs and notices would be posted to notify divers.

Significance After Mitigation

The impact of coliform levels may be significant if occurrences are frequent.

3.8.4 Scenic, Visual, and Recreational Impacts—Mexico

Impacts to scenic, visual, and recreational resources in Mexico would be considered to be significant if they would have a substantial demonstrable negative aesthetic effect or conflict with established recreational uses.

3.8.4.1 Scenic and Visual Resources

Scenic and visual impacts to Mexico were assessed according to the three project locations, the SBIWTP, the Hofer site, and Spooner’s Mesa.

Impacts

The proposed alternatives that would exist at the SBIWTP would not produce an appreciable change in scenic or visual resources. The alternatives are the No Action, Activated Sludge with FEB, Advanced Primary Only, and Partial Secondary Treatment alternatives. The alternatives that would expand onto the Hofer site would produce a greater change in the visual resources. The Activated Sludge with Expanded Capacity alternative would consume less land and increase the amount of land occupied by a facility having the appearance of an industry. The CMA at Hofer site alternative would consume more land but look less industrial. The ponds would, however, have mechanical aeration, which would give the ponds an unnatural look. The AIPS at Spooner’s Mesa alternative would transform the largest area by covering the majority of the top of the mesa with treatment ponds. These ponds would partially contain mechanical aerators and would look the most natural. The alternatives located at the SBIWTP and the Hofer site would be visible from a larger section of Tijuana because of their relatively low elevation. The AIPS at Spooner's Mesa would be visible from nearby higher elevation areas of Tijuana. The impact is considered insignificant because of the generally urban environment that exists throughout the Mexican side of the border.

Mitigation

No mitigation is possible, nor is it considered necessary.

Significance After Mitigation

Mitigation is not required and the impacts are not significant.

3.8.4.2 Recreation

Construction and implementation of the proposed alternatives are not anticipated to affect recreational resources of the Tijuana Municipality or environs; therefore, specific impacts to the current Tijuana/Mexican recreational environment are been addressed or quantified further within this SEIS.

3.9 Air Quality

Impacts from the construction and operation of the SBIWTP 25 mgd (1,095 L/s) activated sludge secondary facilities were assessed in the 1994 Final EIS (RECON, 1994) for the project. Several of the alternatives discussed in the present SEIS would result in facilities being constructed that were previously described in the 1994 Final EIS; consequently, the prior analysis is incorporated by reference with the conclusions carried forward as appropriate. Since release of the 1994 Final EIS, the City of San Diego has produced an EIR/EA for its proposed South Bay Water Reclamation Plant (SBWRP) and Dairy Mart Road Bridge Improvements (DMRBI) project. That EIR contains an independent air quality and odor analysis based upon technical studies prepared by Parsons Engineering Science, Inc. (1995, 1996). Because the SBWRP is adjacent to the SBIWTP and Hofer property and proposes construction of wastewater treatment facilities on a site of similar size and location and using the same access, the results of these studies have been incorporated where appropriate.

3.9.1 Standards of Significance

Air quality impacts would be considered significant if they would noticeably change existing conditions in areas where sensitive receivers occur or would be proposed (e.g., residences) or if the daily emissions significance thresholds established by the South Coast Air Quality Management District would be exceeded. For more information about the regulations and permits that address air quality, see Section 5.1.

3.9.2 No Action

The No Action Alternative consists of the existing SBIWTP that became operational in Spring 1997, plus additional facilities already designed. This No Action alternative was evaluated in the 1994 Final EIS for the SBIWTP as the Dairy Mart Road alternative. The No

Action alternative would result in the construction and operation of a 25-mgd (1,095 L/s) activated sludge secondary treatment plant. The headworks primary treatment process and sludge handling facilities under this alternative have already been constructed and are operational. The secondary treatment facilities include the activated sludge tanks, secondary clarifiers (basins), dissolved air flotation thickeners, and additional sludge storage tanks.

3.9.2.1 Impacts

Construction Related

Exhaust emissions from construction equipment and construction worker's commute trips were analyzed in the 1994 Final EIS for the SBIWTP and were found to meet the CARB and APCD emission threshold limits. No significant impacts would result. Fugitive dust emission impacts were also found to be less than significant, as long as dust control measures are put into effect during construction.

Operations Related

The 25-mgd (1,095 L/s) advanced primary portion of the SBIWTP was completed in early 1997 and includes controls for odor and airborne toxic contaminants at the headworks and sludge handling facilities. The SBIWTP underwent an APCD performance certification in April 1997, which included the testing of the odor control systems in the facilities to determine compliance with the design specifications and APCD performance requirements. The SBIWTP odor control facility performance exceeded the hydrogen sulfide (H_2S) design performance and resulted in levels that were lower than the permit requirements. The sludge from the secondary activated sludge treatment would also be processed at the sludge handling facilities in order to minimize odors and toxic air emissions from that source.

The activated-sludge secondary treatment system that would be added to the current facility was assessed for air quality and odors in the 1994 Final EIS. Covering of the aeration basins or secondary clarifiers was not included in the design. Modeling of potential odor impacts for the 1994 Final EIS found that the emissions from these open tanks under normal operating conditions were predicted to result in discernible odors downwind (typically south or north trending) at a distance of 300 feet (91 m) or less during both extremely unstable and stable atmospheric conditions (RECON, 1994**).** It was determined that the nearest receptors in the United States would be 1,800 feet (550 m) northeast of the SBIWTP at the Coral Gate development. The conclusion was that these receptors should not be adversely affected.

A hydrogen sulfide/odor study was conducted to assess the odor from the advanced primary plant as well as other odor-producing sources within the Tijuana River valley (see Section 2.9). This study concluded that the SBIWTP was currently operating well within odor standards of the APCD and the City of San Diego. The study further concluded that even with the addition of uncovered secondary aeration basins and clarifiers for activated sludge treatment, there would be minimal hydrogen sulfide and odor impacts on the surrounding area (Malcolm Pirnie, 1997a, see Appendix B6.1). Additional hydrogen sulfide and odor modeling was conducted for activated sludge with a peak flow of 50 mgd (Malcolm Pirnie, 1997b, see Appendix B6.2). That model predicted a maximum hourly H_2S

concentration of 0.806 $\mu g/m^3$ and a maximum hourly odor level of 1.226 OU at ground level at or beyond the fenceline of the SBIWTP. For the No Action alternative at a constant flow of 25 mgd, the hydrogen sulfide and odor levels would be lower. The No Action alternative would operate well below the APCD permitted maximum hourly ground level H_2S concentration of 42 $\mu g/m^3$ and the City of San Diego's odor threshold value of 5 OU. It is possible that different conditions such as higher hydrogen sulfide concentrations in the influent wastewater to the SBIWTP and higher temperatures could increase odors from hydrogen sulfide and other compounds. The distance between the facilities and sensitive receptors should be sufficient. In particular, the study concluded that the distance between the SBIWTP and the Coral Gate development provides a sufficient buffer under normal operating and maintenance conditions, even for peak flows of 50 mgd (2,190 L/s). Therefore, this conclusion also applies to the No Action alternative, which would operate at only 25 mgd (1,095 L/s).

In the event of failures in the aeration or pumping equipment, anaerobic surface water conditions could occur in the basins and result in odors. As designed, a redundant power supply and back-up pumps and aerators would mitigate these risks from upsets.

This alternative may be potentially susceptible to toxic loads that reduce beneficial bacteria and reduce treatment levels, thereby causing episodic odor occurrences.

Energy requirements to operate the SBIWTP as an activated sludge secondary facility (approximately 3,450 hp or 2.57 MW) would not result in air emissions that exceed APCD threshold levels. Workers' commute trips and operational support deliveries were included in the original assessment.

3.9.2.2 Mitigation

Grading for construction of the activated sludge facilities would include watering to reduce fugitive dust emissions and other dust suppression techniques (plant cover, covering stockpiles of dirt spoil, restricting onsite vehicles to dust controlled routes, etc.).

Low sulfur/low nitrogen diesel fuels would be used for construction equipment, and the air-to-fuel ratios for each piece of equipment would be optimized to minimize the formation of nitrogen oxides. Rideshare and carpool programs would be established among employees to minimize air emissions and odors.

The processing of secondary sludge would occur in the sludge processing facility, which is equipped with odor and toxic emissions controls. Backup generators would prevent anaerobic surface conditions during power outages.

A potential exists for toxic loads to upset the treatment process causing episodic odor events. Malodorous episodes could be mitigated by a pretreatment program in Mexico that would reduce the concentration of toxic compounds. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

3.9.2.3 Significance After Mitigation

Even with the existing odor-control systems in operation, episodic and localized emissions could occur due either to operating practices or from specific climatic conditions. When sludge trucks move in and out the doors of the solids dewatering buildings, there may be localized emissions. Calm, stable climatic conditions may yield higher values, although this was not indicated by the odor study. Turbulence of the primary sedimentation, such as at the effluent channel, may produce a wider range of values than those recorded and predicted by the study. Because of occasional toxic spikes, odor impacts could occur. These impacts could be mitigated by Mexico's pretreatment program. The potential for episodic impacts from odors to receptors cannot be completely mitigated. The impact would be infrequent, of short duration, and would be considered significant.

3.9.3 SBIWTP with Activated Sludge Secondary Treatment

3.9.3.1 Activated Sludge with Flow Equalization Basin

This alternative is essentially the same as No Action, except that a 7-million-gallon equalization basin would be constructed at the site. The equalization basin would temporarily hold advanced primary treated effluent on a daily basis, thereby equalizing the flow prior to treatment by the activated sludge facility. This would increase the capacity of the SBIWTP to accept, equalize, and treat flows up to 50 mgd (2,190 L/s) by activated sludge secondary treatment.

Impacts

Construction Related

In addition to any impacts described for the No Action alternative (Section 3.9.2.1), this alternative would include the excavation of an earthen basin with a surface area of 2.3 acres (0.9 ha) and 20–foot (6.1 m) depth and associated pipes and pumping. The increase in grading to construction by 74,000 cubic yards (56,600 m^3) would not result in significant additional equipment or fugitive dust emissions.

Operations Related

In the previously mentioned hydrogen sulfide/odor study, modeling was used to predict the levels of hydrogen sulfide and odors that would be generated from the SBIWTP if it were an advanced primary and activated sludge secondary wastewater treatment plant with an average flow of 25 mgd and a peak flow of 50 mgd (Malcolm-Pirnie, 1997b, see Appendix B6.2). While the model was not specifically designated as an activated sludge facility with a flow equalization basin, the model defined the odors that would be generated from this alternative's advanced primary and activated sludge processes. The model predicted a maximum hourly ground level H_2S concentration of 0.806 $\mu g/m^3$ at or beyond the fenceline of the SBIWTP. This is well below the APCD permitted maximum hourly ground level H_2S concentration of 42 $\mu g/m^3$ beyond the plant fenceline. The model also predicted a maximum hourly odor level of 1.226 OU at ground level at or beyond the plant fenceline. This was well below the City of San Diego's suggested threshold value of 5 OU beyond the fenceline. Given the available data, the air dispersion modeling indicated that hydrogen sulfide and other odors would not impact the surrounding area. It is possible that different conditions such as higher hydrogen sulfide concentrations in the influent wastewater to the SBIWTP and higher temperatures could increase odors from hydrogen sulfide and other compounds; however, given the low concentrations predicted by the model and the distance between the SBIWTP and receptors, particularly at the Coral Gate

Development, odors are not expected to impact receptors when plant operations are properly maintained.

Operational odors could be generated by the flow equalization basin if it is not washed or drained daily an potentially cause odors. No significant emissions of hazardous or toxic constituents would result under normal operating conditions.

In the event of failures in the aeration or pumping equipment, anaerobic surface water conditions could occur in the basins and result in odors. As designed, a redundant power supply and back-up pumps and aerators would mitigate these risks from upsets.

The alternative may be potentially susceptible to toxic loads that reduce beneficial bacteria and reduce treatment levels, thereby causing episodic odor occurrences.

Mitigation

In addition to the mitigation measures for the activated sludge secondary treatment plant, a wash-down system to control the build-up of scum and algae, that could otherwise produce offensive odors, is included in the design of the flow equalization basin. A cover would be constructed over the basin if odors become objectionable.

Grading for construction of the flow equalization basin would include watering to reduce fugitive dust emissions and other dust suppression techniques (plant cover, covering stockpiles of dirt spoil, restricting onsite vehicles to dust controlled routes, etc.).

A potential exists for toxic loads to upset the treatment process causing episodic odor events. Malodorous episodes could be mitigated by a pretreatment program in Mexico that would reduce the concentration of toxic compounds. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Even with odor-control systems in operation, episodic and localized emissions could occur due either to operating practice or specific climatic conditions. When sludge trucks move in and out the doors of the solids dewatering buildings, there could be localized emissions. Calm, stable climatic conditions may yield higher values. Turbulence of the primary sedimentation, such as at the effluent channel, could produce a wider range of values than those recorded and predicted by the study. Because of occasional toxic spikes, odor impacts could occur. These impacts could be mitigated by Mexico’s pretreatment program. The potential for episodic impacts from odors to receptors cannot be entirely mitigated. The impact would be infrequent, of short duration, and would be considered significant.

3.9.3.2 Activated Sludge with Expanded Capacity

This alternative would result in the construction and operation of eight additional secondary clarifiers and pumps and internal piping to treat peak flows up to 50 mgd (1,095 L/s) by the activated sludge process. The headworks and primary settling tanks have already been sized to accommodate the overall flows.

Impacts

Construction Related

Construction activities would consist predominantly of grading that would occur over the 43-acre (17.4 ha) Hofer site. Grading would produce 300,000 cubic yards (229,500 m^3) of excess clean soil that would be hauled to nearby property owned by the USIBWC and used to strengthen flood protection embankments. Because of the more extensive earthwork preparation for the basins, grading is anticipated to take about 3 months.

An environmental site assessment was conducted at the Hofer site (Woodward Clyde, 1997). It was found that some of the surface soils contain elevated concentrations of heavy metals and a few organic compounds, primarily from petroleum products. The concentrations are not high enough to be considered hazardous; however, the potential for "hot spots" exceeding the hazardous concentration limits exists. If any of the compounds were detected above the limits for hazardous waste, then the soil from that area would require special handling and disposal at a designated landfill. This condition could require additional dust control measures and trucks.

Operations Related

The overall design of the activated sludge facilities, including aeration basins, dissolved air flotation thickeners, and sludge storage tank would be similar to the No Action alternative with respect to control of air emissions and odors. The additional clarifiers would not be covered because they are typically not a source of objectionable odors or hazardous air emissions. The hydrogen sulfide and odor study modeled an activated sludge facility operating at a peak flow of 50 mgd (Malcolm Pirnie, 1997b, see Appendix B6.2). The model is representative of this alternative. The model results, as described above for the Activated Sludge with Flow Equalization Basin alternative, indicate that hydrogen sulfide and other odors would not impact the surrounding area. It is possible that different conditions such as higher hydrogen sulfide concentrations in the influent wastewater to the SBIWTP and higher temperatures could increase odors from hydrogen sulfide and other compounds; however, given the low concentrations predicted by the model and the distance between the SBIWTP and receptors, particularly at the Coral Gate Development, odors are not expected to impact receptors when plant operations are properly maintained, the APCD hydrogen sulfide limit would be met and the City of San Diego's recommended odor threshold would be met.

Mitigation

In addition to the mitigation measures for the No Action alternative, grading for construction of the clarifiers and associated facilities would include watering to reduce fugitive dust emissions and other dust suppression techniques (plant cover, covering stockpiles of dirt spoil, restricting onsite vehicles to dust controlled routes, etc.) Dust control measures would be increased if any hazardous soils are discovered.

A potential exists for toxic loads to upset the treatment process causing episodic odor events. Malodorous episodes could be mitigated by a pretreatment program in Mexico that would reduce the concentration of toxic compounds. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Even with odor-control systems in operation, episodic and localized emissions could occur due either to operating practices or specific climatic conditions. When sludge trucks move in and out the doors of the solids dewatering buildings, there could be localized emissions. Calm, stable climatic conditions could yield higher values. Turbulence of the primary sedimentation, such as at the effluent channel, could produce a wider range of values than those recorded and predicted by the study. Because of occasional toxic spikes, odor impacts could occur. These impacts could be mitigated by Mexico's pretreatment program. The potential for episodic impacts from odors to receptors cannot be entirely mitigated. The impact would be infrequent, of short duration, and would be considered significant.

3.9.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

Generally for pond treatment systems, anaerobic surface water conditions or overturning of the pond water column by wind and wave action are the most common causes of nuisance odors. Anaerobic surface conditions are not ordinary conditions for either pond technology for these two alternatives. Accumulations of scum or sludge on the edges of pond berms, pond draining, sludge removal, drying and disposal are additional factors known to contribute to nuisance odors unless engineered controls are incorporated into the design and operation. Aqueous to gaseous diffusion of hazardous or toxic constituents from the primary treated pond influent is not expected to be a significant source of air emissions.

3.9.4.1 Completely Mixed Aerated System at Hofer Site

The completely mixed pond alternative at the 43-acre (17.4 ha) Hofer site would use four fully mixed ponds and two partially mixed ponds with a total surface area of 28.5 acres (11.5 ha). The fully mixed ponds would include cells with anaerobic digester pits. These cells would have surface aeration by mechanical aerators. Surface aeration effectively converts malodorous compounds produced under anaerobic conditions to oxidized compounds, which do not have nuisance odors. Flow through the system to the effluent distribution structure would be by gravity, with provision for recycling from the partially mixed ponds to the fully mixed ponds. Total hydraulic retention time is approximately 5 days. Each pond would be vigorously aerated. The total energy requirements for pumping and aeration are estimated at 2,532 hp or 2.89 MW.

Impacts

Construction activities would consist predominantly of grading that would occur over the 43-acre (17.4 ha) Hofer site. Grading would produce 300,000 cubic yards (229,500 m^3) of excess clean soil. Half of this soil would be used at the SBIWTP and the remainder would be hauled offsite. Because of the more extensive earthwork preparation for the basins, grading is anticipated to take about 3 months.

An environmental site assessment was conducted at the Hofer site (Woodward Clyde, 1997). It was found that some of the surface soils contain elevated concentrations of heavy metals and a few organic compounds, primarily from petroleum products. The concentrations are not high enough to be considered hazardous; however, the potential for "hot spots" exceeding the hazardous concentration limits exists. If any of the compounds are detected above the limits for hazardous waste, then the soil from that area would require special handling and disposal at a designated landfill. This condition could require additional dust control measures and trucks for soil disposal.

Power for aeration and pumping would be increased by 2,532 hp (2.89 MW) over Advanced Primary Only but would be less than the No Action and Activated Sludge alternatives. Emissions related to this increase in energy consumption would not be considered significant.

The hydrogen sulfide/odor study modeled the emissions that would be generated by the primary and pond treatment facilities of the CMA at Hofer Site alternative, referred to in the study as the "CC-2/Pond System" scenario (Malcolm Pirnie, 1997b, see Appendix B6.2). Emissions data from an earlier odor study (Malcolm Pirnie, 1997a, see Appendix B6.1) were supplemented with measurements of emissions collected from a completely mixed aerated pond system, the Coachella Mid-Valley Water Reclamation Plant. The influent to the Coachella plant is domestic wastewater only. The wastewater from Tijuana is both domestic and industrial wastewater that will have somewhat different properties in terms of emission and odors. Those differences were not taken into account when modeling this alternative in the study.

Emissions were measured from December 2 through 8, 1997. Modeling for the CMA at Hofer Site alternative was conducted using the measurements and assuming an average flow of 25 mgd and a peak flow of 50 mgd. The predicted H_2S levels ranged up to a maximum hourly ground level H_2S concentration of 0.786 $\mu g/m^3$ at or beyond the fenceline of the SBIWTP, well below the permit limit of 42 $\mu g/m^3$ set by the APCD. The model predicted a 0.464 OU maximum hourly ground level concentration at or beyond the plant fenceline, also well below the City of San Diego suggested threshold value of 5 OU beyond the fenceline. Given the available data, the air dispersion modeling indicates that hydrogen sulfide and other odors would not impact the surrounding area. It is possible that different conditions such as higher hydrogen sulfide concentrations in the influent wastewater to the SBIWTP and higher temperatures could increase odors from hydrogen sulfide and other compounds; however, given the low concentrations predicted by the model and the distance between the SBIWTP and receptors, particularly at the Coral Gate Development, odors are not expected to impact receptors when plant operations are properly maintained.

As described, the anaerobic digester pits are covered with an aerated layer to prevent odors. The completely mixed aeration cells in these ponds would not result in increased odor generation relative to the activated sludge aeration basins or secondary clarifiers under normal operating conditions. In the second partially mixed aerated ponds, continuous mechanical aeration of the surface water creates an aerated surface layer, preventing odors as it does for the anaerobic digester pits. Seasonal overturn is prevented by turbulent surface water aeration in all ponds.

In the event of failures in the aeration equipment, anaerobic surface water conditions could occur in the ponds and result in odors. As designed, a redundant power supply and back-up aerators would mitigate these risks from upsets. The ponds may be potentially susceptible to toxic loads that reduce beneficial bacteria and reduce treatment levels. However, multiple ponds provide for increased detention and dilution of influent that reduce the impacts of episodic toxic loads more effectively than for the Activated Sludge and No Action alternatives.

Mitigation

The same measures used to mitigate the No Action alternative would be used to mitigate this alternative.

Grading for construction of the pond treatment facilities would include watering to reduce fugitive dust emissions and other dust suppression techniques (plant cover, covering stockpiles of dirt spoil, restricting onsite vehicles to dust controlled routes, etc.). Dust control measures would be increased if any hazardous soils are discovered.

High surface aeration would be maintained during normal operations and during pond draining for sludge removal. If this approach is not satisfactory, the sludge would be removed by dredging and dewatered using existing equipment.

A back-up power source for the mechanical aeration of the ponds would ensure that there is no interruption in the aeration process.

The potential for malodorous episodes could be mitigated by a pretreatment program in Mexico that would reduce the concentration of toxic compounds. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Even with odor-control systems in operation, episodic and localized emissions could occur due either to operating practices or specific climatic conditions. When sludge trucks move in and out of the doors of the solids dewatering buildings, there may be localized emissions. Calm, stable climatic conditions may yield higher values. Turbulence of the primary sedimentation, such as at the effluent channel, may produce a wider range of values than those recommended and predicted by the study. Because of occasional toxic spikes, odor impacts could occur, although this possibility is less for the Hofer site alternative than it is for the activated sludge-based secondary alternatives. The potential for odors caused by this mechanism is considered less than significant. These impacts could be mitigated by Mexico’s pretreatment program.

3.9.4.2 Advanced Integrated Pond System at Spooner’s Mesa Site

This alternative requires that SBIWTP primary effluent be pumped to Spooner’s Mesa to the ponds for secondary treatment. The pond system would consist of six initial ponds with anaerobic digester pits and partial aeration, six secondary ponds with anaerobic digester pits and partial aeration, and three settling ponds. The combined surface area would be 78 acres. In the first and second set of ponds, treatment would be provided biologically by algae and by mechanical aerators. All surface water layers are aerated. Total hydraulic residence time is 15 days. Power requirements are 7,500 hp (5.6 MW) for the lift pumps for the influent, 1,600 hp (1.2 MW) for aeration, and 90 hp (.06 MW) for internal pond recirculation.

Impacts

Construction Related

Grading for pond construction would be more extensive than for other alternatives. Grading for the ponds is estimated to cover a total area of 102 acres (4.6 ha). There would also be a requirement for construction of a major pipeline to the site, an effluent disposal pipeline to the SBLO, an access road, and a pump station to pump effluent from the SBIWTP to the ponds, and grading for a construction access road in Smuggler Gulch and up to Spooner's Mesa. While the daily emissions would be comparable to those set forth in Table 3.9-2, the grading could take longer than the other alternatives.

Operations Related

The power requirements for the lift pumps for this alternative would more than double the total energy consumption required relative to the advanced primary alternative. Based upon SCAQMD emission factors, however, it would not exceed the significance threshold at which offsets are required for stationary sources.

The first two sets of ponds have anaerobic layers overlain by approximately 10 feet (3 m) of aerated water. The third set of ponds are settling ponds and are not aerated but contain aerated effluent recycled from the second set of ponds. Odor impacts from wastewater treatment facilities at this location have not been studied although the hydrogen sulfide and odor study for the CMA at Hofer Site alternative (Malcolm Pirnie, 1997b, see Appendix B6.2) is useful for predicting odor levels. It is reasonable to expect that odors from this alternative would be in the same order of magnitude as for the other secondary treatment alternatives. The ponds would not generate adverse odors under normal operating conditions. The third set of ponds may experience annual "seasonal overturn" which might produce odors. Seasonal overturn can cause anaerobic bottom sediment to rise and cause odors unless mechanical aeration is applied.

This alternative may be potentially susceptible to toxic loads that reduce beneficial bacteria and reduce treatment levels, thereby causing episodic odor occurrences. Because of the very large volume of water in this system, the dilution capacity is greatest. Therefore, the potential for odors from toxic loads is the least of all the secondary alternatives and is considered insignificant.

The nearest receptors in the United States to the north and east are also about 1,300 feet (396 m) away and are approximately 300 feet (91 m) below the mesa. The potential for adverse odor impacts is insignificant due to the differences in elevation and distance to receptors.

Mitigation

Construction Related

Grading for construction would include watering to reduce fugitive dust emissions and other dust suppression techniques (plant cover, covering stockpiles of dirt spoil, restricting onsite vehicles to dust controlled routes, etc.).

Low sulfur/low nitrogen diesel fuels would be used for construction equipment, and the air-to-fuel ratios for each piece of equipment would be optimized to minimize the formation of nitrogen oxides. Rideshare and carpool programs would be established among employees to minimize air emissions and odors.

Operations Related

Provision of a back-up power source for the mechanical aeration of the ponds using a dual (redundant) power feed would minimize the risk of upset. Provision of mechanical aerators for the third set of ponds and immediate aeration in the event of seasonal overturn would mitigate the potential for odors from this source. Odors would be considered insignificant.

Malodorous episodes could be mitigated by a pretreatment program in Mexico that would reduce the concentration of toxic compounds. United States agencies, in cooperation with local agencies, would continue to assist Mexico to implement its pretreatment program.

Significance After Mitigation

Even with odor-control systems in operation, episodic and localized emissions could occur at the SBIWTP for the conventional primary process operations due either to operating practices or specific climatic conditions. When sludge trucks move in and out of the doors of the solids dewatering buildings, there may be localized emissions. Calm, stable climatic conditions may yield higher values than those recorded and predicted in the hydrogen sulfide/odor study. Turbulence of the primary sedimentation, such as at the effluent channel, may produce a wider range of values than those recorded and predicted by the study. Because of the distance to receptors, the odors are considered less than significant. However, the potential for odors caused by toxic loads is lowest for the Spooner's Mesa alternative and considered insignificant.

3.9.5 SBIWTP with Less than Full Secondary Effluent

3.9.5.1 Advanced Primary Only

This alternative assumes the ongoing use of the SBIWTP with the current advanced primary treatment facilities. The headworks and sludge storage systems all have odor and hazardous or toxic air contaminant controls. The advanced primary SBIWTP underwent an APCD performance certification in April 1997. The odor control facility performed better than both the designed performance level and the permit requirements for hydrogen sulfide. The headworks and sludge storage systems do not produce nuisance odors or air emissions above the APCD threshold levels.

The initial hydrogen sulfide/odor study assessed odors from the SBIWTP and other nearby odor-producing sources within the Tijuana River valley (Malcolm Pirnie, 1997a; see Appendix B6.1). Over a 7-day period the air was sampled for hydrogen sulfide. Sampling at the water surface of the primary sedimentation tanks produced relatively low .008 to .036 $\mu g/m^3$) which is consistent with the quiescent water condition. Average and peak values of hydrogen sulfide at the fenceline of the SBIWTP were lower than average and peak values found at monitoring points by Stewart's Drain at the United States-Mexico border (see Table 3.9-1). Based on the actual hydrogen sulfide concentrations measured (see Table 2.9-3), the SBIWTP is currently operating well within the 5 OU recommended odor standard of the City of San Diego and the APCD hydrogen sulfide permit limit of 42 $\mu g/m^3$ beyond the fenceline.

Table 3.9-1
SUMMARY OF HYDROGEN SULFIDE RESULTS ($\mu g/m^3$)
AVERAGE OVER 7-DAY SAMPLING PERIOD (10/29/97-11/04/97)

SBIWTP Fenceline		Stewart's Drain		Proposed Coral Gate Development		Primary Sedimentation Tank
Average	Peak	Average	Peak	Average	Peak	
0.012	0.027	0.020	0.043	0.012	0.021	0.017

Source: Malcolm-Pirnie, November 1997

A second study was conducted to model hydrogen sulfide and odor levels from an advanced primary facility followed by a secondary facility operating at an average flow of 25 mgd and a peak flow of 50 mgd. The model predicted a maximum hourly ground level concentration of 0.806 $\mu g/m^3$ and an odor level of 1.226 OU at or beyond the fenceline. For the Advanced Primary Only alternative, hydrogen sulfide and odors would be produced at even lower levels.

Impacts

Even with odor-control systems in operation, episodic and localized emissions could occur as a result of either operating practices or specific climatic conditions. When sludge trucks move in and out the doors of the solids dewatering buildings, there may be localized emissions. Calm, stable climatic conditions may yield higher values. Turbulence of the primary sedimentation, such as at the effluent channel, may produce a wider range of values than those recorded and predicted by the study.

This alternative would not result in any significant additional odor or air emissions from the SBIWTP. No significant impacts would result.

Mitigation

No mitigation measures are necessary.

Significance After Mitigation

No significant adverse impacts would result.

3.9.5.2 Partial Secondary Treatment

Impacts

This alternative has the same facilities as the No Action alternative. The impacts from emissions and odors and mitigation measures would be about the same. The odor levels might be higher during peak flows but would not exceed the low levels predicted for the other activated sludge alternatives.

Mitigation

Mitigation measures are the same a for the No Action alternative.

Significance After Mitigation

Even with odor-control systems in operation, episodic and localized emissions could occur due either to operating practices or specific climatic conditions. When sludge trucks move in and out the doors of the solids dewatering buildings, there could be localized emissions. Calm, stable climatic conditions could yield higher values. Turbulence of the primary sedimentation, such as at the effluent channel, could produce a wider range of values than those recorded and predicted by the study. Because of occasional toxic spikes, odor impacts could occur. These impacts could be mitigated by Mexico's pretreatment program. The potential for episodic impacts from odors to receptors cannot be entirely mitigated. The impact would be infrequent, of short duration, and would be considered significant.

3.9.6 Air Quality Impacts—Mexico

The SBIWTP and Hofer site are located about 600 feet (183 m) from residents living across the border in Mexico. The nearest residents, or other receptors, to the Spooner's Mesa site are located about 1,300 feet (396 m) away in Mexico. Also located nearby in Mexico is Pump Station One which directs raw wastewater flows of about 38 mgd to San Antonio de los Buenos and to the SBIWTP. Pump Station One is not equipped with odor scrubbers and is a significant source of odors. Based on the air quality and odor study conducted for the 1994 Final EIS (RECON, 1994) and the recent hydrogen sulfide and odor studies (Malcolm Pirnie, 1997a and 1997b, see Appendix B6.1 and B6.2), it appears unlikely that objectionable odors from the SBIWTP would impact receptors in Mexico under normal operating conditions for any of the alternatives. The 1994 Final EIS air quality and odor study predicted that odors would be discernable downwind from the SBIWTP to a distance of about 300 feet (91 m). This was a primary reason why none of the treatment processes for any of the alternatives would be located within 300 feet (91 m) of the border. Given the distance, the existing air emissions controls on the headworks and sludge handling facility, and the recent studies that predict very low odor levels, emissions are also not expected to significantly impact air quality in Mexico. For those alternatives that include an activated sludge treatment process, a possibility exists that toxic compounds could upset the process, resulting in an odor episode. Plant upsets would likely occur infrequently and the distance to receptors suggests that the impact would be less than significant. Air quality and odor impacts to Mexico are considered insignificant.

3.10 Geology

Impacts to the proposed project from potential geologic hazards are discussed in this subsection. The existing geologic setting is described in Section 2.10 of this document.

3.10.1 Standards of Significance

NEPA does not specify standards of significance for impacts to geology. Appendix G of the CEQA Guidelines states that a project would normally have a significant impact if it exposed "people or structures to major geological hazards." Geologic hazards could include earthquakes, landslides, mudslides, ground failure, or similar hazards. Appendix I of the CEQA Guidelines further states that potential environmental impacts related to geology could be considered significant if they result in: (1) unstable earth conditions or changes in geologic substructures, disruptions, displacements, compaction, or overcovering of the soil;

(2) changes in topography or ground surface relief features; or (3) destruction, covering, or modification of any unique geologic or physical feature. In the absence of other guidance, this CEQA definition of significance is used in this document.

3.10.2 No Action

With the No Action alternative, the SBIWTP would have the same activated sludge secondary treatment as described in the 1994 Final EIS (RECON, 1994). The average and peak flows through both primary and secondary treatment would be 25 mgd (1,095 L/s).

3.10.2.1 Impacts

Impacts under the No Action alternative were evaluated in the 1994 Final EIS for the SBIWTP. Thus, no additional impacts from geologic constraints would result that were not already evaluated.

3.10.2.2 Mitigation

Under the No Action alternative, mitigation is not applicable.

3.10.2.3 Significance After Mitigation

No significant geologic impacts not previously evaluated would occur.

3.10.3 SBIWTP with Activated Sludge Secondary Treatment

This alternative comprises activated sludge secondary treatment at the SBIWTP to accommodate an average flow of 25 mgd (1,095 L/s) with options for varying peaking factors. The first option's peaking factor, discussed in Section 3.10.3.1, involves the construction of a flow equalization basin to accommodate a peak flow of up to 50 mgd (2,190 L/s). The second option, discussed in Section 3.10.3.2, involves an increase in the capacity of the secondary facility at the SBIWTP to treat peak flows up to 50 mgd (2,190 L/s). To accomplish this second option, the number of secondary clarifiers would be doubled.

3.10.3.1 Activated Sludge with Flow Equalization Basin

Impacts

This alternative would be constructed with a flow equalization basin located on the SBIWTP site. The SBIWTP site is the location of the original evaluation in the 1994 Final EIS. No additional impacts that were not already evaluated would result if this alternative were implemented.

Mitigation

Since the site for this alternative is the same as for the No Action alternative, no mitigation not previously evaluated or implemented would occur.

Significance After Mitigation

No significant geological impacts would occur.

3.10.3.2 Activated Sludge with Expanded Capacity

This alternative would be constructed with expanded clarifier capacity located on the Hofer site. The Hofer site was included as part of the original SBIWTP site evaluated in the 1994 Final EIS. The Hofer site is located between the SBIWTP site, which contained compressible soils, and the SBWRP site, which does not contain compressible soils.

Impacts

Because this alternative would be built at the same SBIWTP location and Hofer site as evaluated in the 1994 Final EIS, no additional impacts from geological constraints not previously evaluated would result if this alternative were implemented. Compressible soils may be present in some areas of the site.

Mitigation

Mitigation measures for this alternative would be the same as those identified in the 1994 Final EIS. In particular, deep dynamic compaction would be necessary if any areas are underlain by compressible soils.

Significance After Mitigation

The necessary mitigation measures would reduce impacts to a level less than significant.

3.10.4 SBIWTP with Ponds Secondary and Secondary-Equivalent Treatment

3.10.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

Since this alternative would be built at the Hofer site, the geologic constraints would be the same as those discussed above in Section 3.10.3.

Mitigation

Mitigation measures for this alternative would be the same as those identified above in Section 3.10.3 for Activated Sludge with Flow Equalization Basin.

Significance After Mitigation

The necessary mitigation measures would reduce impacts to a level less than significant.

3.10.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

Geotechnical information about the Spooner's Mesa site is limited. However, geotechnical investigations of nearby areas revealed generally favorable geologic and soils conditions in the Spooner's Mesa area. The mesa is underlain with Linda Vista formation over San Diego formation. The San Diego formation consists predominantly of reddish brown cobble conglomerate with a sandstone matrix, which generally possesses adequate bearing characteristics for fill or structures. The mesa has little topsoil, so there should be no impacts due to liquefaction, or expansive or compressible soils.

The La Nacion-San Ysidro fault zone, located northeast of the mesa, is the closest system of faults. The mapped faults in the study area are not considered to be currently active, and are not expected to impact the proposed project; however, ground shaking from an earthquake on a regionally active fault may affect the site. A maximum probable earthquake of magnitude 6.5 (Richter scale) on the Coronado Bank fault zone may produce a horizontal peak ground acceleration of 0.18 gravity (g) at the project site. A maximum probable earthquake of 7.0 magnitude on the less seismically active Rose Canyon fault may produce a horizontal peak ground acceleration of 0.25 g on both sites.

Mitigation

The effects of seismic shaking can be reduced by adhering to the most recent edition of the Uniform Building Code and current design parameters of the Structural Engineers Association of California. If required, a geologist would observe excavations during construction to detect the presence of unmapped traces in the general vicinity of mapped fault traces. The potential for surface rupture should not be considered a constraint for the proposed project because that potential is considered low for most of the fault traces mapped in the project area.

Significance After Mitigation

The necessary mitigation measures would reduce the seismic impacts to a level less than significant.

3.10.5 SBIWTP with Less than Full Secondary Effluent

3.10.5.1 Advanced Primary Only

Impacts

Since this alternative is already built there are no new geological impacts.

Mitigation

Under this alternative, mitigation is not applicable. Identified mitigations have already been implemented for compressive soils.

Significance After Mitigation

No new significant geological impacts would occur.

3.10.5.2 Partial Secondary Treatment

Impacts

Since this alternative would be built at the same location as the No Action alternative, the geologic constraints would be the same as those discussed above in Section 3.10.2.

Mitigation

Under the No Action alternative, mitigation is not applicable. Identified mitigations have already been implemented for compressive soils.

Significance After Mitigation

No new significant geologic impacts not previously evaluated would occur under this alternative.

3.10.6 Geology Impacts–Mexico

Implementation of the proposed alternatives are not anticipated to affect or be affected by the geological characteristics of Mexico. Therefore, specific impacts to the geologic environment in Tijuana, Mexico have not been addressed or quantified further within the present SEIS.

3.11 Noise

This section presents the potential noise impacts of the different alternatives associated with the project. These include noise effects from both short-term construction and long-term operation of each of the alternatives. Where necessary, mitigation measures are provided. Although the areas surrounding the site have been designated as agricultural, this document analyzes noise impacts in conformance with standards for both residential and agricultural areas.

3.11.1 Standards of Significance

Noise impacts would be considered significant if the noise standards established by the City of San Diego noise ordinance and the General Plan would be exceeded. For more information about the regulations that address noise, see Section 5.1.

3.11.2 No Action

3.11.2.1 Impacts

There have been no new impacts identified since those discussed in the 1994 Final EIS.

3.11.2.2 Mitigation

No mitigation is required because no impacts are projected. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

3.11.2.3 Significance After Mitigation

No significant noise impacts would occur under this alternative.

3.11.3 SBIWTP with Activated Sludge Secondary Treatment

3.11.3.1 Activated Sludge with Flow Equalization Basin

Impacts

Under this alternative, flow equalization facilities capable of storing peak flows greater than 25 mgd (1,095 L/s) would be constructed. The average flow through both the advanced primary and secondary portion of the plant is 25 mgd (1,095 L/s) with flow through the secondary portion equalized to a constant rate of 25 mgd (1,095 L/s), and flows through the primary portion varying from a low of 3.5 mgd (153 L/s) to a peak flow of 50 mgd (2,190 L/s).

The proposed new facilities would be the same as those proposed under the No Action alternative with the addition of one 7-million-gallon (31,815,000 liters) equalization basin along with a pump station for pumping flow to the activated sludge process.

Noise impacts from construction activities, traffic, and operations would be similar to those discussed under the No Action alternative. The overall construction noise levels would be the same [maximum 74 dBA at 100 feet (30.5 m) from the site]. No construction noise impacts would be expected given that there are no sensitive receptors in proximity to the site.

Traffic noise generated by construction vehicles could increase the existing noise level along Dairy Mart Road from approximately 56 CNEL to 62 CNEL as predicted in the 1994 Final EIS. Although this is a substantial increase, no sensitive human receptors are adjacent to this roadway, and noise levels would not exceed the 65 CNEL residential standard set by the City of San Diego.

Mitigation

No mitigation is required because no impacts are projected. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Significance After Mitigation

No significant noise impacts would occur under this alternative.

3.11.3.2 Activated Sludge with Expanded Capacity

Impacts

Under this alternative, the secondary treatment facilities would be sized to treat peaks up to 50-mgd (2,190 L/s). This would require that 16 secondary clarifiers be constructed instead of the 8 clarifiers required under the No Action and Activated Sludge Secondary Treatment (with FEB) alternatives. Some of these clarifiers would be constructed on the Hofer site.

With the addition of the eight additional clarifiers, excavation, grading, and possibly dynamic compaction would be required using backhoes, scrapers, and compactors for an approximate 3-month period. Construction noise would be in the range of 74 dBA L_{eq} at 100 feet (30.5 m). No construction noise impacts would be expected since there are no sensitive receptors in proximity to the site. Surrounding land uses are agricultural and livestock properties, and are not expected to be affected by construction operations.

Traffic noise generated by construction vehicles could increase the existing noise level along Dairy Mart Road from approximately 56 CNEL to 62 CNEL as predicted in the 1994 Final EIS. Although this is a substantial increase, no sensitive human receptors are adjacent to this roadway, and noise levels would not exceed the 65 CNEL residential standard set by the City of San Diego.

Noise increases above No Action levels during operations would be insignificant from the additional clarifiers because they are quiet processes.

Mitigation

No mitigation is required since no impacts are projected. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Significance After Mitigation

No significant noise impacts would occur under this alternative. (See the 1994 Final EIS.)

3.11.4 SBIWTP with Ponds Secondary Treatment

3.11.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the Hofer site adjacent to the existing SBIWTP for treatment of 25 mgd (1,095 L/s) average flow with peaks of 50 mgd (2,190 L/s). Facilities would include six fully or partially mixed ponds, a control building, distribution structures, and pump stations.

Excavation, grading, and possibly dynamic compaction would be required using backhoes, scrapers, and compactors for an approximate 3-month period. Construction noise would be in the range of 74 dBA L_{eq} at 100 feet (30.5 m). No construction noise impacts would be expected since there are no sensitive receptors in proximity to the site. Surrounding land uses are agricultural and livestock properties, and are not expected to be affected by construction operations. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Traffic noise generated by construction vehicles could increase the existing noise level along Dairy Mart Road from approximately 56 CNEL to 62 CNEL as predicted in the 1994 Final EIS. Although this is a substantial increase, no sensitive human receptors are adjacent to this roadway, and noise levels would not exceed the 65 CNEL residential standard set by the City of San Diego.

During long-term operation of the ponds for secondary treatment, no operational noise impacts are predicted. The primary noise source at the Hofer site would be aerators in the ponds, but this is not considered a significant source. No sensitive human receptors are within distance to be affected by this increase. Thus, no long-term noise impacts are expected under this alternative.

Mitigation

No mitigation is required because no significant short-term construction or long-term operation noise impacts are projected.

Significance After Mitigation

No significant noise impacts would occur under this alternative.

3.11.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

This alternative would require the addition of secondary treatment ponds and associated facilities at the currently undeveloped Spooner's Mesa site to treat 25 mgd (1,095 L/s) average flow and peaks of 50 mgd (2,190 L/s). New facilities introduced at the site would include a total of 15 ponds (12 aerated), and a control building. Other nearby facilities would include distribution structures and a pump station.

Construction activities would introduce a short-term source of noise to the existing undeveloped property and localized stretch of land to the east. These activities would include excavation, grading, and other construction, and would take place over an approximate 4-month period. Excavation of the ponds would occur sequentially, using graders, backhoes and compactors. Excavated material from the ponds would be balanced onsite. Construction vehicles would be expected to generate noise in the range of 74 dBA L_{eq} at 100 feet (30.5 m). To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

The pipeline distribution system would be constructed along Monument Road, extending west from the SBIWTP, south into Smuggler Gulch, then up the slope of Spooner's Mesa to the ponds. Typical noise levels for construction of pipelines would not exceed 74 dBA L_{eq} at 100 feet (30.5 m). To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Traffic noise generated by some haul trucks would increase the existing noise level along Monument Road. Traffic currently contains numerous trucks. Although the construction traffic would increase for a short-term period, only a few residents are adjacent to this roadway and noise levels would not exceed the 65 CNEL residential standard set by the City of San Diego.

Long-term operation of the ponds for secondary treatment is not expected to generate a significant noise increase at Spooner's Mesa. The primary noise source would be the aerators in the ponds, but aerator noise would not be considered significant. The pump station for this alternative at the SBIWTP would be designed not to exceed the 75 dBA L_{eq} 1-hour average noise level limit established for agricultural land uses.

Noise impacts to sensitive wildlife that may be present on Spooner's Mesa or the pipeline alignment during construction are discussed in Section 3.2, Biological Resources.

Mitigation

No mitigation is required because no significant short-term or long-term operational noise impacts are expected.

Significance After Mitigation

No significant noise impacts would be expected under this alternative.

3.11.5 SBIWTP with Less than Full Secondary Effluent

3.11.5.1 Advanced Primary Only

Impacts

Under this alternative, no additional facilities are provided. Thus, no new construction activities would be required. The existing SBIWTP would be operated as under current conditions, providing advanced primary treatment only, with ultimate discharge through the SBOO.

Since no construction noise would be generated, no construction noise impacts would occur. As other alternatives, long-term operation would generate noise levels in the range of 67 dBA and would not be expected to impact surrounding land uses. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Mitigation

No mitigation is required because no impacts are projected.

Significance After Mitigation

No significant noise impacts would occur under this alternative.

3.11.5.2 Partial Secondary Treatment

Impacts

This alternative is similar to the No Action alternative, except that flows greater than 25 mgd (1,095 L/s) (up to 50 mgd [2,190 L/s]) would receive advanced primary treatment and would then be bypassed around the secondary process to the SBOO. The proposed additional facilities for secondary treatment are the same as those described in the No Action alternative.

As with the No Action alternative, no construction-related noise impacts or long-term operational impacts are anticipated under this alternative given that the surrounding land uses are livestock and agriculture. To protect workers at the SBIWTP site during construction of the secondary treatment facilities, all applicable California Occupational Safety and Health Act requirements would be met.

Mitigation

No mitigation is required because no impacts are projected.

Significance After Mitigation

No significant noise impacts would occur under this alternative.

3.11.6 Noise Impacts—Mexico

Noise impacts in Mexico would be considered significant if they would cause perceptible increases in average noise levels to sensitive receptors (e.g., residential areas, schools, and hospitals).

Table 3.11-1 shows the relative ranking of alternatives for potential noise impacts to Mexico. Most of the noise during operations is caused by sludge trucks on International Avenue.

Table 3.11-1
RELATIVE NOISE IMPACTS TO MEXICO

Alternative	Construction	Operations
No Action	5	1
Activated Sludge with FEB	4	1
Activated Sludge with Expanded Capacity	3	1
CMA at Hofer Site	2	4
AIPS at Spooner's Mesa	1	5
Advanced Primary Only	6	3
Partial Secondary Treatment	5	2

1 = Highest level of noise

None of the project alternatives is anticipated to result in a significant impact to sensitive noise receptors within the City of Tijuana or Mexico. The areas within Tijuana near the SBIWTP have an existing ambient noise environment typical of high density residential, commercial, and industrial urban development and are not likely to be affected by the construction noise associated with the project alternatives. The predominant noise along the border in the vicinity of the project sites is vehicular noise on International Avenue. Typical construction noise would be at or below 74 dBA at a distance of 100 feet (30.5 m) and 62 dBA at 400 feet (122 m) from the construction activities. Construction would be scheduled for normal work hours to avoid disruption caused by early- or late-hour construction operations.

During operations, all alternatives would require the off-hauling of sludge from the SBIWTP to Mexico for disposal. Daily hauling is a necessary part of the treatment plant operation, and would require from 5 to 9 trucks per night depending on the eventual alternative selected. The number of trucks is not expected to significantly increase noise levels. As currently required, trucks would haul the sludge at night, which could possibly disturb residents near the SBIWTP and along International Avenue. Because the locations of sludge disposal areas have not been identified, and because ambient noise levels along International Avenue have not been measured, it is not possible to accurately predict the effect of sludge-hauling or existing noise levels. The additional noise caused by 5 to 9 truck trips per night is not expected to be significant.

Mitigation

No mitigation is proposed.

Significance After Mitigation

No significant noise impacts to sensitive receptors within Mexico would result from construction of the proposed alternatives. The potential for significant noise impacts from sludge hauling is uncertain but expected to be low.

3.12 Energy Consumption

This section evaluates those aspects of the proposed alternatives that could potentially pose significant adverse impacts to energy resources. The primary energy resources of concern include electricity, fossil fuels (gasoline and diesel fuel), and natural gas. Energy use during construction was estimated in part on the cost. The earthwork quantity was considered the main factor for major construction equipment use. The energy for operations was based on equipment sizing and earlier estimates prepared to quantity the cost of energy consumption by each alternative.

3.12.1 Standards of Significance

Although there are no specific federal standards that indicate what would be considered a significant impact in terms of energy consumption, normally an action would be considered to have a significant effect on the environment if it encourages activities that result in the use of large amounts of fuel, or if it uses fuel or energy in a wasteful manner. For the purposes of this document, energy impacts attributable to the proposed project are considered significant if implementation would result in any of the following:

- Substantial expansion of the existing electrical energy supply infrastructure (e.g., generation, transmission, and distribution lines) to service the proposed project
- Substantial increase over baseline conditions in peak load (kilowatts and power production (kilowatt hours)
- Substantial increase over baseline conditions in fuel consumption required to construct the project facilities, or to transport, handle, and dispose of sludge
- Use of energy in a wasteful or inefficient manner
- Increase of annual energy consumption of at least 1 percent of the total current or projected baseline energy resource annual consumption within the San Diego region

3.12.2 No Action

3.12.2.1 Impacts

For the alternatives considered in this SEIS, construction-related energy consumption would be dominated by the need to undertake extensive energy intensive activities, such as large-scale excavation, production of concrete, and transport of excavated material and concrete. Further, operational-related energy consumption for fixed facilities would be dominated by electrical energy consumed during operations such as pumping and aeration. The energy required for operations is substantially higher than the energy consumed for construction. Table 3.12-1 illustrates the relative ranking of construction and operational energy consumption for the proposed alternatives, with number 1 representing the highest level of consumption and 7 the lowest. This ranking is used in the following analysis by comparing the No Action and other alternative to the highest energy consuming alternative for construction and operations. In both cases, the AIPS at Spooner's Mesa alternative has the highest relative consumption of energy. This is discussed more fully in Section 3.12.4.2.

Table 3.12-1
PROJECT ALTERNATIVES RELATIVE ENERGY RANKING

Alternative	Construction	Operations
AIPS at Spooner's Mesa	1	1
Activated Sludge with Expanded Capacity	2	2
Activated Sludge with FEB	3	3
No Action	4	4
Partial Secondary Treatment	5	5
CMA at Hofer Site	6	6
Advanced Primary Only	7	7

1 = Highest level of energy use

Construction

The No Action alternative would result in the construction and operation of a 25-mgd (1,095 L/s) activated sludge secondary treatment facility at the SBIWTP. Construction-related energy consumption would primarily be related to equipment/vehicle fossil fuel use (essentially all diesel fuel). As noted in Section 3.12.4.2, construction of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during construction than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its construction energy impact also is less than significant.

Operation

The primary energy consumption component associated with operations would be electrical energy consumed during operation of the advanced primary treatment facility and activated sludge aeration with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact. Therefore, since this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative , as shown in Table 3.12-1, its operational energy impact also is less than significant.

3.12.2.2 Mitigation

No mitigation measures are required.

3.12.2.3 Significance After Mitigation

The potential for adverse energy resource impacts under the No Action alternative is not significant.

3.12.3 SBIWTP with Activated Sludge Secondary Treatment

3.12.3.1 Activated Sludge with Flow Equalization Basin

Impacts

This alternative would result in a flow of 25 mgd (1,095 L/s) into the SBIWTP with flow equalization basins to accommodate peak flow storage and subsequent off-peak discharge to the secondary activated sludge facility. The flow equalization basins would provide a storage volume of 7 MG and be capable of storing peak flows greater than 25 mgd (1,095 L/s).

Construction

Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel fuel). As noted in Section 3.12.4.2, construction of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during construction than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its construction energy impact also is less than significant.

Operation

The primary energy consumption component associated with operations would be electrical energy consumed during operation of the advanced primary treatment facility and activated sludge aeration with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its operational energy impact also is less than significant.

Mitigation

No mitigation is required.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.3.2 Activated Sludge with Expanded Capacity

Impacts

This alternative would be sized to treat peak flows up to 50 mgd (2,190 L/s) by doubling the number of secondary clarifiers to accommodate the peaks.

Construction
Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel fuel). As noted in Section 3.12.4.2, construction of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during construction than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its construction energy impact also is less than significant.

Operation
The primary energy consumption component associated with operations would be electrical energy consumed during operation of the advanced primary treatment facility and activated sludge aeration with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its operational energy impact also is less than significant.

Mitigation

No mitigation is required.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.4 SBIWTP with Ponds Secondary or Secondary-Equivalent Treatment

3.12.4.1 Completely Mixed Aerated System at Hofer Site

Impacts

This alternative would use a completely mixed aerated process, requiring construction of six aerated ponds.

Construction
Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel fuel). As noted in Section 3.12.4.2, construction of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during construction than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its construction energy impact also is less than significant.

Operation

The primary energy consumption component associated with operations would be electrical energy consumed during operation of the primary treatment facility and process aeration with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its operational energy impact also is less than significant.

Mitigation

No mitigation is required.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.4.2 Advanced Integrated Pond System at Spooner's Mesa Site

Impacts

The AIPS at Spooner's Mesa alternative would require construction of 15 ponds with partial mechanical aeration, a pump station, recycle pumps, and a control building.

Construction

Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel fuel). As shown in Table 3.12-1, the AIPS at Spooner's Mesa alternative has the highest level of construction-related energy consumption of the alternatives considered by virtue of the extensive excavation activities required.

The following types and numbers of diesel-fueled construction equipment would be used at the Spooner's Mesa site during an approximate 4-month period; these figures represent a "worst-case" estimate, since not all of the equipment listed actually would be used throughout the construction period:

- 6 Loaders
- 12 Scrapers
- 6 Rollers
- 6 Graders
- 6 Excavators
- 6 Water trucks, onsite only
- 1 Generator
- 1 Pump

According to the United States EPA, heavy-duty construction equipment and vehicles consume from 5 to 20 gallons (19 to 76 liters) of diesel fuel per hour (EPA, 1991). Assuming that all of the above construction equipment continuously consumes fuel at the maximum 20 gal/hr (76 L/hr) rate over the entire 4-month construction period (8 hr/day, 6 days/week, 16 weeks), construction of this alternative would consume approximately 645,120 gallons (2.4 million liters) of diesel fuel. As noted in Section 2.15.1, the SANDAG indicates that, in 1990, transportation-related diesel fuel consumption within the San Diego region totaled approximately 77 million gallons (291.4 million liters) (SANDAG, 1994). Under this "worst-case" scenario, the amount of fossil fuel (diesel) energy consumed during construction for this alternative represents approximately 0.8 percent of the 1990 annual fossil fuel (diesel) energy consumption in the San Diego region. Consequently, construction of the AIPS at Spooner's Mesa alternative does not result in a significant energy resource impact.

Operation

The primary energy consumption component associated with AIPS operations would be electrical energy consumed during operation of the primary treatment facility, pumping primary effluent to Spooner's Mesa, and process aeration with minor contributions from facility support uses (e.g., lighting). As shown in Table 3.12-1, the AIPS at Spooner's Mesa represents the highest level of operational energy consumption of the alternatives considered.

Annual electrical energy consumed during operations for this alternative is estimated to be approximately 386,000 kWh, a level less than 0.002 percent of the current annual electrical energy consumption in the San Diego region. Consequently, operation of the AIPS at Spooner's Mesa alternative does not result in a significant energy resource impact.

Mitigation

There are some measures that could be considered to reduce energy consumption. These include consideration of flow equalization or energy recovery. If this alternative is selected, additional analysis would be conducted to identify how energy recovery could improve the energy efficiency of this alternative.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.5 SBIWTP with Varying Levels of Primary Treatment

3.12.5.1 Advanced Primary Only

Impacts

Construction

This alternative would not require construction of any new facilities; consequently, there are no construction-related energy impacts.

Operation

The primary energy consumption component associated with operations would be electrical energy consumed during operation of the advanced primary treatment facility , with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its operational energy impact also is less than significant.

Mitigation

No mitigation is required.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.5.2 Partial Secondary Treatment

Impacts

This alternative would require construction of the same new facilities as for the No Action alternative.

Construction

As with the No Action alternative, this alternative would result in the construction and operation of a 25-mgd, activated-sludge secondary treatment works at the Hofer site. Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel fuel). As noted in Section 3.12.4.2, construction of the AIPS at Spooner's Mesa alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during construction than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its construction energy impact also is less than significant.

Operation

The primary energy consumption component associated with operations would be electrical energy consumed during operation of the advanced primary treatment facility and activated sludge aeration with minor contributions from facility support uses (e.g., lighting). As noted in Section 3.12.4.2, operation of the AIPS alternative does not result in a significant regional energy resource impact; therefore, because this alternative consumes less energy during operation than the AIPS at Spooner's Mesa alternative, as shown in Table 3.12-1, its operational energy impact also is less than significant.

Mitigation

No mitigation is required.

Significance After Mitigation

The potential for adverse energy resource impacts under this alternative is not significant.

3.12.6 Energy Impacts—Mexico

3.12.6.1 Impacts

The proposed alternatives would be considered to have a significant impact if their implementation would encourage activities in Mexico that result in the use of large amounts of fuel, or if it would use Mexican fuel or energy resources in a wasteful manner. From this perspective, construction of the project alternatives is not anticipated to result in a direct or indirect impact to energy usage patterns within the Tijuana Municipality or environs. Operation of the alternatives may result in a decrease of energy consumed at

Pump Station One as flow directed to the treatment plant does not need to be pumped. With the exception of fuel consumed by sludge transport and disposal activities, all other energy consumed by the proposed project alternatives would originate in the U.S. As noted previously in Section 3.5.5, the volume of sludge truck traffic for non-pond alternatives is estimated to be on the order of 5 to 9 trucks per day, which would constitute an insignificant percentage of Tijuana / Mexican current fossil fuel consumption.

Consequently, energy impacts attributable to the proposed project would not directly or indirectly result in or cause substantial expansions to or increases in:

- The existing Tijuana / Mexico electrical energy supply infrastructure
- Baseline conditions in Tijuana / Mexico peak power load (kilowatts) and energy production (kilowatt hours)
- Baseline conditions in Tijuana / Mexico fuel consumption required to construct the project facilities, or to transport, handle, and dispose of sludge
- Use of Tijuana / Mexican energy resources in a wasteful or inefficient manner

3.12.6.2 Mitigation

No mitigation is required.

3.12.6.3 Significance After Mitigation

The potential for adverse energy resource impacts to Mexico under this alternative is not significant.